Vol. 1109 Number 1

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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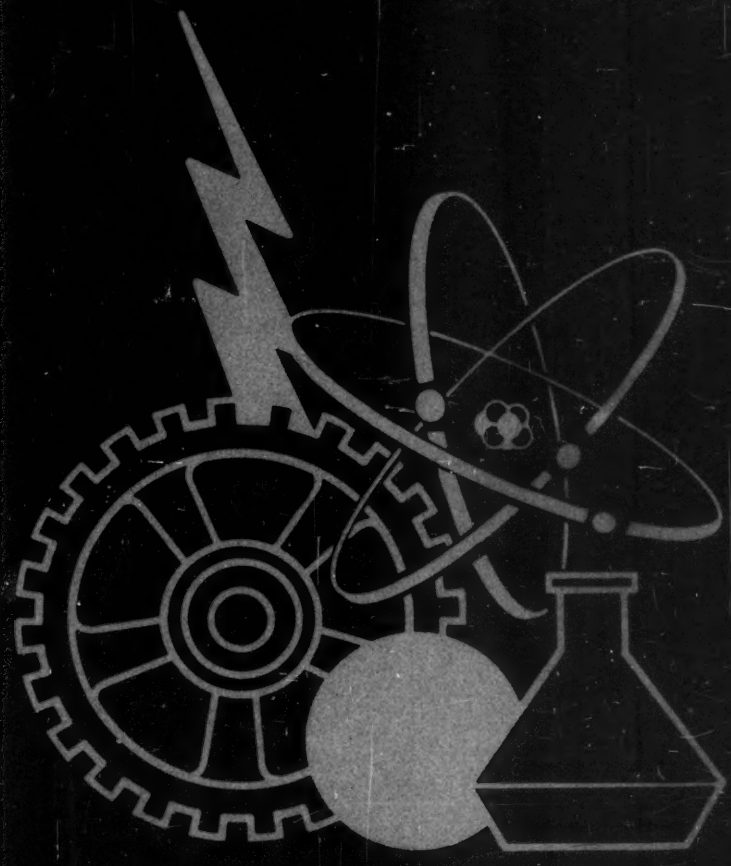
PATENTS

DECEMBER 5, 1989



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 1, 1990, and was announced in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	
—If paid before Jan. 1, 1990	1040.00
—If paid on or after Jan. 1, 1990	1140.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Nov. 7, 1989.

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Patent Cooperation Treaty (PCT) Update

Change in International Search Fee Charged by the European Patent Office Effective Jan. 1, 1990

The International Bureau of the World Intellectual Propety Organization has informed the U. S. Patent and Trademark Office that, due to changes in the exchange rate of the U. S. dollar in relation to the German Mark, the dollar amount of the international search fee charged by the European Patent Office for international applications filed in the United States Receiving Office will be $1,140.00, effective January 1, 1990.

Nov. 6, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks

Patent Cooperation Treaty Update

The United States Patent and Trademark Office has received notification from the World Itellectual Propety Organization that Canada deposited its instrument of ratification to the Patent Cooperation Treaty (PCT) on 02 October 1989. Therefore, according to PCT Article 63(2), Canada may be designated in international applications filed on and after 02 January 1990.

The Danish Patent Office has informed the International Bureeau that the Danish Parliament has approved the law ratifying the European Convention (EPC) and that the instrument of ratification will be deposited in time for the Convention to enter into force for Denmark on January 1, 1990. Consequently, as from January 1, 1990, it will be possible to file international applications designating Denmark for a national patent or for a European patent or for both.

Listing of PCT Member Countries

Country	Ratification or Accession	Date of Ratification or Accession	Effective Date
(1)Central African Republic*	Accession	15 September 1971	01 June 1978
(2)Senegal*	Ratification	08 March 1972	01 June 1978
(3)Madagascar	Ratification	27 March 1972	01 June 1978
(4)Malawi	Accession	16 May 1972	01 June 1978
(5)Cameroon*	Accession	15 March 1973	01 June 1978
(6)Chad*	Accession	12 February 1974	01 June 1978
(7)Togo*	Ratification	28 January 1975	01 June 1978
(8)Gabon*	Accession	06 March 1975	01 June 1978
(9)United States of America	Ratification	26 November 1975	01 June 1978
(10)Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11)Congo*	Accession	08 August 1977	01 June 1978
(12)Switzerland**	Ratification	14 September 1977	01 June 1978
(13)United Kingdom**	Ratification	24 October 1977	01 June 1978
(14)France**	Ratification	25 November 1977	01 June 1978
(15)Soviet Union	Ratification	29 December 1977	01 June 1978
(16)Brazil	Ratification	09 January 1978	01 June 1978
(17)Luxembourg**	Ratification	31 January 1978	01 June 1978
(18)Sweden**	Ratification	17 February 1978	01 June 1978
(19)Japan	Ratification	01 July 1978	01 October 1978
(20)Denmark**	Ratification	01 September 1978	01 December 1978
(21)Austria**	Ratification	23 January 1979	23 April 1979
(22)Monaco	Ratification	22 March 1979	22 June 1979
(23)Netherlands**	Ratification	10 April 1979	10 July 1979
(24)Romania	Accession	23 April 1979	23 July 1979
(25)Norway	Ratification	01 October 1979	01 January 1980
(26)Liechtenstein**	Accession	19 December 1979	19 March 1980
(27)Australia	Accession	31 December 1979	31 March 1980
(28)Hungary	Ratification	27 March 1980	27 June 1980
(29)Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30)Finland	Ratification	01 July 1980	01 October 1980
(31)Belgium**	Ratification	14 September 1981	14 December 1981
(32)Sri Lanka	Accession	26 November 1981	26 February 1982
(33)Mauritania*	Accession	13 January 1983	13 April 1983
(34)Sudan	Accession	16 January 1984	16 April 1984
(35)Bulgaria	Accession	21 February 1984	21 May 1984
(36)Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37)Mali*	Accession	19 July 1984	19 October 1984
(38)Barbados	Accession	12 December 1984	12 March 1985
(39)Italy**	Ratification	28 December 1984	28 March 1985
(40)Benin*	Accession	26 November 1986	26 February 1987
(41)Burkina Faso*	Accession	21 December 1988	21 March 1989
(42)Spain**	Accession	16 August 1989	16 November 1989
(43)Canada	Ratification	02 October 1989	02 January 1990

*Members of African Intellectual Propety Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI countries. A designation of any country is an indication that all OAPI countries have been designated. Only one designation fee is due regardless of the number of OAPI countries designated.

**Member of European Patent Convention (EPC) regional patent system. Either national or European patents for member countries are available through PCT, except for France, Belgium and Italy, for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries under the PCT.

November 7, 1989

JEFFREY M. SAMUELS
Acting Commissioner
of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on December 02, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,625,334 through 4,627,107
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 30, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,360,930 through 4,361,911
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 17, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,541,125	06/524,604	09/17/85
4,541,128	06/605,417	09/17/85
4,541,131	06/635,509	09/17/85
4,541,133	06/449,254	09/17/85
4,541,135	06/600,458	09/17/85
4,541,137	06/555,062	09/17/85
4,541,141	06/442,745	09/17/85
4,541,142	06/516,355	09/17/85
4,541,148	06/580,741	09/17/85
4,541,149	06/579,510	09/17/85
4,541,151	06/553,471	09/17/85
4,541,156	06/517,432	09/17/85
4,541,158	06/510,757	09/17/85
4,541,163	06/603,165	09/17/85
4,541,174	06/616,874	09/17/85
4,541,177	06/480,876	09/17/85
4,541,178	06/538,633	09/17/85
4,541,180	06/545,944	09/17/85
4,541,185	06/535,648	09/17/85
4,541,190	06/573,714	09/17/85
4,541,193	06/571,934	09/17/85
4,541,195	06/604,178	09/17/85
4,541,198	06/668,167	09/17/85
4,541,202	06/590,452	09/17/85
4,541,211	06/477,371	09/17/85
4,541,212	06/607,508	09/17/85
4,541,218	06/613,243	09/17/85
4,541,219	06/516,200	09/17/85
4,541,220	06/499,145	09/17/85
4,541,224	06/634,016	09/17/85
4,541,229	06/508,247	09/17/85
4,541,240	06/493,930	09/17/85
4,541,245	06/673,109	09/17/85
4,541,246	06/557,899	09/17/85
4,541,249	06/675,526	09/17/85
4,541,251	06/560,955	09/17/85
4,541,256	06/462,459	09/17/85
4,541,258	06/355,494	09/17/85
4,541,260	06/393,063	09/17/85
4,541,265	06/632,251	09/17/85
4,541,267	06/501,426	09/17/85
4,541,272	06/494,390	09/17/85
4,541,275	06/533,178	09/17/85
4,541,283	06/632,318	09/17/85
4,541,284	06/592,970	09/17/85
4,541,307	06/544,924	09/17/85
4,541,310	06/636,920	09/17/85
4,541,318	06/633,787	09/17/85
4,541,320	09/459,589	09/17/85
4,541,321	06/547,336	09/17/85
4,541,332	06/606,936	09/17/85
4,541,334	06/664,149	09/17/85
4,541,336	06/595,212	09/17/85
4,541,342	06/679,082	09/17/85
4,541,346	06/551,924	09/17/85
4,541,354	06/595,143	09/17/85
4,541,362	06/545,970	09/17/85
4,541,369	06/600,815	09/17/85
4,541,376	06/559,604	09/17/85
4,541,379	06/636,529	09/17/85
4,541,391	06/593,915	09/17/85
4,541,395	06/573,209	09/17/85
4,541,397	06/605,278	09/17/85
4,541,401	06/373,890	09/17/85
4,541,408	06/642,697	09/17/85
4,541,411	06/629,356	09/17/85
4,541,412	06/466,818	09/17/85

Patent Number	Serial Number	Issue Date
4,541,416	06/437,664	09/17/85
4,541,425	06/572,194	09/17/85
4,541,434	06/510,305	09/17/85
4,541,435	06/546,079	09/17/85
4,541,443	06/492,808	09/17/85
4,541,445	06/613,700	09/17/85
4,541,448	06/365,882	09/17/85
4,541,450	06/380,895	09/17/85
4,541,458	06/476,231	09/17/85
4,541,466	06/269,905	09/17/85
4,541,469	06/538,332	09/17/85
4,541,471	06/608,046	09/17/85
4,541,504	06/442,199	09/17/85
4,541,505	06/517,901	09/17/85
4,541,506	06/370,160	09/17/85
4,541,508	06/518,310	09/17/85
4,541,514	06/398,637	09/17/85
4,541,523	06/520,413	09/17/85
4,541,534	06/652,652	09/17/85
4,541,539	06/579,449	09/17/85
4,541,540	06/593,923	09/17/85
4,541,550	06/496,463	09/17/85
4,541,552	06/294,249	09/17/85
4,541,554	06/685,895	09/17/85
4,541,557	06/492,428	09/17/85
4,541,562	06/529,365	09/17/85
4,541,576	06/483,311	09/17/85
4,541,577	06/571,858	09/17/85
4,541,580	06/550,579	09/17/85
4,541,583	06/690,082	09/17/85
4,541,590	06/400,086	09/17/85
4,541,616	06/613,513	09/17/85
4,541,633	06/417,836	09/17/85
4,541,637	06/465,447	09/17/85
4,541,640	06/458,968	09/17/85
4,541,643	06/507,736	09/17/85
4,541,644	06/476,035	09/17/85
4,541,652	06/634,222	09/17/85
4,541,654	06/571,544	09/17/85
4,541,657	06/430,889	09/17/85
4,541,666	06/500,872	09/17/85
4,541,668	06/618,689	09/17/85
4,541,683	06/553,617	09/17/85
4,541,696	06/477,349	09/17/85
4,541,698	06/505,733	09/17/85
4,541,710	06/579,155	09/17/85
4,541,714	06/520,320	09/17/85
4,541,717	06/559,366	09/17/85
4,541,735	06/685,805	09/17/85
4,541,740	06/578,668	09/17/85
4,541,742	06/490,576	09/17/85
4,541,754	06/506,495	09/17/85
4,541,757	06/512,307	09/17/85
4,541,759	06/556,491	09/17/85
4,541,760	06/633,513	09/17/85
4,541,765	06/495,690	09/17/85
4,541,783	06/497,122	09/17/85
4,541,787	06/351,272	09/17/85
4,541,800	06/566,202	09/17/85
4,541,804	06/488,901	09/17/85
4,541,811	06/469,538	09/17/85
4,541,816	06/574,579	09/17/85
4,541,825	06/453,006	09/17/85
4,541,827	06/439,764	09/17/85
4,541,833	06/594,293	09/17/85
4,541,839	06/626,830	09/17/85
4,541,846	06/548,639	09/17/85
4,541,854	06/648,486	09/17/85
4,541,856	06/554,957	09/17/85
4,541,858	06/591,615	09/17/85
4,541,864	06/546,870	09/17/85
4,541,865	06/610,884	09/17/85
4,541,868	06/516,235	09/17/85
4,541,875	06/713,318	09/17/85
4,541,892	06/639,587	09/17/85
4,541,912	06/560,456	09/17/85
4,541,913	06/433,519	09/17/85
4,541,919	06/638,608	09/17/85
4,541,927	06/676,107	09/17/85
4,541,933	06/610,132	09/17/85
4,541,937	06/564,158	09/17/85
4,541,943	06/610,801	09/17/85
4,541,949	06/528,568	09/17/85
4,541,951	06/650,709	09/17/85
4,541,955	06/458,264	09/17/85
4,541,959	06/645,356	09/17/85
4,541,963	06/671,243	09/17/85
4,541,975	06/388,657	09/17/85
4,541,985	06/402,131	09/17/85
4,541,990	06/556,564	09/17/85
4,541,991	06/457,003	09/17/85
4,541,993	06/553,635	09/17/85
4,541,994	06/516,237	09/17/85
4,542,004	06/594,167	09/17/85
4,542,054	06/541,682	09/17/85
4,542,057	06/678,045	09/17/85
4,542,074	06/618,973	09/17/85
4,542,076	06/544,885	09/17/85
4,542,100	06/641,173	09/17/85
4,542,117	06/512,740	09/17/85
4,542,121	06/570,364	09/17/85
4,542,127	06/479,906	09/17/85
4,542,139	06/603,987	09/17/85
4,542,140	06/543,712	09/17/85
4,542,148	06/366,321	09/17/85
4,542,150	06/239,744	09/17/85
4,542,181	06/405,432	09/17/85
4,542,182	06/405,599	09/17/85
4,542,189	06/535,726	09/17/85
4,542,205	06/651,144	09/17/85
4,542,211	06/586,203	09/17/85
4,542,212	06/342,461	09/17/85
4,542,215	06/496,151	09/17/85
4,542,227	06/588,176	09/17/85
4,542,250	06/455,520	09/17/85
4,542,262	06/320,060	09/17/85
4,542,272	06/582,290	09/17/85
4,542,278	06/558,356	09/17/85
4,542,286	06/446,537	09/17/85
4,542,290	06/460,529	09/17/85
4,542,291	06/428,322	09/17/85
4,542,297	06/367,335	09/17/85
4,542,311	06/565,952	09/17/85
4,542,316	06/384,511	09/17/85
4,542,328	06/432,450	09/17/85
4,542,335	06/466,669	09/17/85
4,542,341	06/336,781	09/17/85
4,542,385	06/408,561	09/17/85
4,542,387	06/467,165	09/17/85
4,542,396	06/421,930	09/17/85
4,542,421	06/381,572	09/17/85
4,542,445	06/567,934	09/17/85
4,542,446	06/540,876	09/17/85
4,542,447	06/611,854	09/17/85
4,542,451	06/539,936	09/17/85
4,542,455	06/517,986	09/17/85
4,542,460	06/348,775	09/17/85
4,542,465	06/394,917	09/17/85
4,542,469	06/407,608	09/17/85
4,542,490	06/571,647	09/17/85
4,542,493	06/327,672	09/17/85
4,542,494	06/435,918	09/17/85
4,542,501	06/554,048	09/17/85
4,542,524	06/413,342	09/17/85
4,542,535	06/521,492	09/17/85

Erratum

PATENTS WHICH EXPIRED JULY 16, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number		Patent Number	Issue Date
4,582,706	Should Have Read	4,528,706	07/16/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,522,828, Re. S. N. 421,303, Filed Oct. 11, 1989, Cl. 514/ , THERAPEUTIC AGENTS, James E. Jeffery, Owner of Record: *The Boats Co.*, Attorney or Agent: Donald A. Peterson, Ex. Gp.: 126

4,547,758, Re. S. N. 07/426,569, Filed Oct. 6, 1989, Cl. 335/ 302, CYLINDRICAL PERMANENT MAGNET AND METHOD OF MANUFACTURING, Motsharu Shimizu, Owner of Record: *Hitachi Metals Ltd., Tokyo, Japan*, Attorney or Agent: Richard V. Burguyian, Ex. Gp.: 216

4,636,443, Re. S. N. 296,427, Filed Jan. 12, 1989, Cl. 428/ 481, DECORATIVE LAMINATORS AND METHOD OF PRODUCING SAME, Richard F. Jaisle, et al., Owner of Record: *Formica Technology, Inc.*, Attorney or Agent: Donald A. Peterson, Ex. Gp.: 154

4,701,952, Re. S. N. 07/424,699, Filed Oct. 20, 1989, Cl. 381/ 25, FREQUENCY ATTENUATION COMPENSATED PNEUMATIC HEADPHONE AND LIQUID TUBE AUDIO SYSTEM FOR MEDICAL USE, Jefferson H. Taylor, Owner of Record; *Inventor*, Attorney or Agent: Donald D. Evenson, Ex. Gp.: 261

4,703,355, Re. S. N. 07/426,022, Filed Oct. 23, 1989, Cl. 358/ 149, AUDIO TO VIDEO TRIMING EQUALIZER METHOD AND APPARATUS, J. Carl Cooper, Owner of Record: *Inventor*, Attorney or Agent: Charles R. Rust, Ex. Gp. 262

4,704,719, Re. S. N. 07/426,570, Filed Oct. 25, 1989, Cl. 372/ 50, GAS LASER WITH AT LEAST ONE EXCITATION TUBE WHERE THROUGH GAS IS ACTUALLY FLOWING, Hardy P. Weiss, Owner of Record: *Torya Silicone Co. Ltd., Tokyo, Japan*, Attorney or Agent: Ronald J. Shore, Ex. Gp.: 251

4,772,020, Re. S. N. 07/424,852, Filed Oct. 20, 1989, Cl. 273/65, HELICALLY GROOVED FOAM FOOTBALL, Rod G. Martin, Owner of Record: *Inventor*, Attorney or Agent: Brian D. Ogonowsky, Ex. Gp.: 334

4,855,860, Re. S. N. 07/424/925, Filed Oct. 23, 1989, Cl. 361/ 045, GROUND-FAULT PROTECTED BALLAST, Ole K. Nilssen, Owner of Record: *Inventor*, Attorney or Agent: None, Ex. Gp.: 214

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,094,432, Reexam No. 90/001,878, Requested Oct. 30, 1989, Cl. 220/67, INDUSTRIAL DRUMS, Seymor Zilbert, Owner of Record: *Bergen Barrel & Drum Co., Kearny, N. J.*, Attorney or Agent: Unknown, Ex. Gp.: 240, Requester: Armin Corp., Jersey City, N. J.

4,435,732, Reexam No. 90/001,876, Requested Oct. 20, 1989, Cl. 358/254, ELECTRO-OPTICAL ILLUMINATION CONTROL SYSTEM, Gilbert P. Hyatt, Owner of Record: *Inventor, Cypress, Calif.*, Attorney or Agent: None, Ex. Gp.: 260, Requester: Hoffman, Wasson, Fallow & Gitler, Arlington, Va.

4,619,352, Reexam No. 90/001,877, Requsted Oct. 31, 1989, Cl. 192/41A, ONE-WAY CLUTCH, Masao Shoji, Owner of Record: *NSK-Warner, K.K., Tokyo, Japan*, Attorney or Agent: Shapiro & Shapiro, Ex. Gp.: 350, Requester: Owner

4,739,396, Reexam No. 90/001,869, Requested Oct. 23, 1989, Cl. 358/60, ELECTRO-OPTICAL ILLUMINATION CONTROL SYSTEM, Gilbert P. Hyatt, Owner of Record: *Inventor, Cypress, Calif.*, Attorney or Agent: None, Ex, Gp.: 260, Requester: Hoffman, Wasson, Fallow & Gitler, Arlington, Va. 22202

4,762,129, Reexam No. 90/001,870, Requested Oct. 25, 1989, Cl. 128/344, DILATION CATHETER, Tassilo Bonzel, Owner of Record: *Inventor, Fulda, Germany*, Attorney or Agent: P. C. Richardson, Ex. Gp.: 330, Requester: Wolf, Greenfield & Sacks, Boston, Mass.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation shall be proceeded with as in the case of default.

The Italian Market, Inc., Greenville, S.C., Reg. No. 1,517,564, for the mark "THE ITALIAN MARKET" and design, Canc. No. 17,670.

ERMA S. BROWN
Administrator of the Trademark Trial and Appeal Board
For JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Department of Commerce
Patent and Trademark Office
37 CFR Part I
Docket No. 81024-9224
Rin 0651-AA30

Revision of Patent Application Filing Practices

Agency: Patent And Trademark Office, Commerce
Action: Final Rule
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases, Part I of Title 37, Code of Federal Regulations, to clarify requirements in the filing of patent applications and to provide for procedures to cure certain defects in the filing of applications.
Effective Date: Jan. 16, 1990.
For Further Information Contact: J. Michael Thesz by telephone at (703) 557-8384 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Proposed rulemaking requesting comments was published on Nov. 30, 1988 in the *Federal Register* at 53 FR 48402-48421 and on Dec. 13, 1988, in the *Official Gazette* at 1097 O.G. 16-35 regarding adjusting patent and trademark fee amounts and including proposed changes to the rules involved in this rulemaking. The period for receiving comments on the rules involved in this rulemaking was extended by a notice published on Feb. 15, 1989 in the *Federal Register* at 54 FR 6936. The final rules adjusting patent and trademark fee amounts were published Feb. 15, 1989 in the *Federal Register* at 54 FR 6893-6910 and on March 7, 1989 in the *Official Gazette* at 1100 O.G. 7-25.

Comments on the rules involved in this rulemaking were received from two patent law associations and from three individuals. The comments received relating to particular sections and replies thereto are listed below.

Comments Related to Section 1.53

Comment: One comment suggested that it would be helpful to new practitioners, in particular, if section 1.53 was amended to specify that continuation and divisional applications may be filed under section 1.53.

Reply: The suggestion in the comment has been adopted. Language has been added to paragraph (b) of section 1.53 to specify what types of applications may be filed under sections 1.53, 1.60 and 1.62. Also, the information about filing continuation and divisional applications from paragraph (a) of section 1.60 has been placed in paragraph (b) of that section to clarify that the information applies only to applications filed under section 1.60.

Comment: One comment stated support for the proposed petition for correcting a failure to name the inventors of an application on filing but suggested that the rule should be "liberalized to indicate that the inventors do *not* need to be named at the time the application is filed, but may be named later when filing the declaration or oath." Another comment expressed no opposition for requiring a petition and fee for late submission of the names of the inventors but argued that a filing date should be granted regardless thereof since 35 U.S.C. 111 provides for a filing date upon submission of a specification and drawing.

Reply: This suggested modification to the rule has not been adopted. The suggested modification was not proposed for comment. Further, United States patent practice has long required naming all the inventors on filing. The petition procedure of the rule as amended provides adequate relief where the inventors are not named on filing through administrative oversight, for example. It is not appropriate, however, to adopt a procedure where applications could routinely be filed without naming the inventors since this would delay the processing of the applications and since the name of the inventor is often required to provide a unique identifier for an application. The name of the inventor is not only used by attorneys to identify an application but is used to locate an application within the Office, for example, when the serial number is unknown. To delay the date when the inventors are named would unduly add to the administrative burden of the Office.

Comment: One comment stated that the proposed requirement for satisfactorily explaining the delay in supplying the inventors' names was improper since 35 U.S.C. 111 uses the language "within such period and under such conditions" as may be prescribed by the Commissioner. The comment stated that "satisfactorily" implies other and unknown standards, which are not specified conditions although requiring the petitioner to explain the delay is a condition.

Reply: The comment has been adopted in that the language of the final rule does not use "satisfactorily". The final rule requires that the petition set forth the reasons the delay in supplying the names of the inventors should be excused. It is appropriate to require reasons since there may be reasons when such a petition would not be granted, e.g., where the sole reason given that the names of the inventors were not supplied was to purposely delay the processing of the application.

Comments Related to Section 1.60

Comment: One comment questioned whether under section 1.60 there is need for a petition satisfactorily explaining the delays in filing the true copy of the application or a statement that it is a true copy or whether these items should be permitted to be filed without explanation as in the case of an oath submitted after the filing date of an application under section 1.53.

Reply: The filing of an oath later than the filing date of an application, with the payment of a surcharge, under section 1.53 is expressly permitted by 35 U.S.C. 111. No such provision exists for applications filed under section 1.60. Further, it is not appropriate to encourage, in any way, the delay in processing and examining applications filed under section 1.60. The requirement for a petition with a satisfactory explanation of the delay, e.g., that the copy was omitted through inadvertence rather than for purposes of delaying the application, is considered to be appropriate.

Commment Related to Section 1.60 and 1.62

Comment: One comment supported the provisions of proposed sections 1.60 and 1.62 for excusing 1) the failure to file a true copy of the prior application or the statement that the papers are a true copy (in section 1.60) or 2) the error of filing a copy of the prior application or a new specification (in section 1.62). The comment, however, stated a belief that applicants should have the option of proceeding under either of these proposed rules or under section 1.53 to obtain as the filing date the original date of receipt of the continuing application papers, if desired.

Reply: It is already possible for an applicant to petition under 37 CFR 1.182 to have an application filed under sections 1.60 and 1.62 converted to an application under section 1.53. These different types of applications have different requirements, are reviewed by different personnel within the Office, and are processed in different manners. Conversion from a section 1.60 or 1.62 application to a section 1.53 application involves an administrative burden to the Office. Sections 1.60 and 1.62 as amended provide specific procedures so that applicants can correct the mentioned errors. These procedures should provide the remedy desired by applicants in all but very unusual situations. It is not necessary or appropriate to try to address these very unusual situations in this rulemaking.

Comments Related to Section 1.62

Comment: One comment suggested that Section 1.62(e) should refer to an amendment to the prior application as it exists "at the time of filing of the application under this section" rather than the time of filing the prior application.

Reply: The language suggested in the comment has been adopted.

Comment: One comment questioned whether a petition and fee or denial of filing date were necessary where a copy of a specification from the prior application or a new specification is improperly filed with an application under section 1.62. The comment suggested that a clerk could simply disregard the copy or the specification and place it somewhere in the file with some sort of notation that it is not accepted.

Reply: Changes to the prior application when filing under section 1.62 must be made by amendment to the prior application as it exists at the time of filing the section 1.62 application since the papers from the prior application including the specification are used to constitute the file wrapper continuing application under 37 CFR 1.62. Experience has shown that, when a copy of a specification or a new specification is filed with a section 1.62 application , a different type of application may have actually been desired. For example, a continuing application under section 1.60 may have been desired with the prior application not being expressly abandoned as occurs under section 1.62(g). Also, in the case of a continuation-in-part application, presumably the new disclosure would be contained in the specification erroneously filed with the section 1.62 application. Thus, it is not appropriate to just disregard the copy or the new specification filed with the section 1.62 application. To do so in the first example would result in an unwanted express abandonment. To do so in the second example would disregard the new invention disclosed in the erroneously filed specification. This would raise the possibility of a statutory bar under 35 U.S.C. 102(b) arising if, for example, the new invention was placed on sale in expectation that a filing date would be accorded to the application including the new disclosure. The course of action adopted is to stop the processing of the application as soon as the error is detected, to notify applicant of the error and to give applicant an opportunity to correct the error in whatever way was intended through the filing of a petition and fee.

Comment: One comment questioned whether an amendment, and not a petition, cancelling an improperly submitted copy of a specification filed with a request for a section 1.62 application would be appropriate to obtain a filing date as of the original date of filing the continuing application papers.

Reply: Paragraph (j) of section 1.62 does provide for correction of the filing error, e.g., by amendment cancelling the copy of the prior application, without the filing of a petition and fee

provided the correction is made before the payment of the issue fee, abandonment of or termination of proceedings on the prior application. In such a case, the filing date will be the date of receipt of the correction. However, if the date of deposit is necessary or desired as the filing date, a petition and fee are required. This is appropriate in view of the extra Office handling and processing which is necessitated by applicant's error on filing.

Comment: One comment stated that proposed paragraphs (e) and (j) of section 1.62, when read together, seemed to indicate that a filing date would be granted as of the date the filing error was corrected and not as of the date of deposit of the application. It was suggested that paragraph (e) should expressly state that once the specification is cancelled, the application will be accorded a filing date as of the date of filing of the request for the section 1.62 application.

Reply: The suggestion in the comment has been adopted. Language has been added to section 1.62(e) to state that a filing date "as of the date of deposit of the request for an application under this section" may be granted if an appropriate petition is filed.

Discussion of Specific Rules

Section 1.17, paragraph (i)(1), is amended to include reference to the petitions set forth in sections 1.53, 1.60 and 1.62 by this rulemaking.

Section 1.21, as amended, adds a new paragraph (n) setting forth the fee for handling incomplete or improper applications under sections 1.53(c), 1.60 and 1.62.

Section 1.53, paragraph (b), is amended to establish a procedure whereby the failure to name all the inventors on filing an application, which results in a filing date not being accorded to the application, can be excused upon the filing of a petition which sets forth reasons sufficient to show that the delay in supplying the names should be excused. If the petition is granted, the application would be accorded a filing date as of the date the original papers were deposited. No specific provision allowing this relief was previously in the rules. Paragraph (b) is also amended to specify that a continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and section 1.78(a)) may be filed under sections 1.53, 1.60 and 1.62, that a continuation-in-part application may be filed under sections 1.53 or 1.62 and that the requirements for obtaining a filing date set forth in paragraph (b) apply to applications filed under section 1.53. Paragraph (c), as amended, sets forth the procedure which the Office uses to notify an applicant that the names of the inventors have been omitted and refers to the handling fee set in section 1.21(n), rather than including the fee amount in the rule. This practice is consistent with the other rules which refer to fees.

Section 1.55, paragraph (a), is amended to clarify the language of the rule by adding "an" before "interference".

Section 1.60 is amended to remove and reserve paragraph (a) and to amend paragraph (b) to include the information presently in paragraph (a) so as to clarify that the information applies only to applications filed under this section. Paragraph (b) is also amended to require that an applicant, who desires to file an application under the rule, indicate that the application is being filed pursuant to the rule. Applications which are not specifically designated as being filed under section 1.60 are considered as having been filed under section 1.53, which does not require an originally executed declaration before a filing date is given. The amendment also establishes a procedure whereby the failure to file a true copy of the prior application or the statement that the papers are a true copy, which results in a filing date not being accorded the application, can be excused upon the filing of a petition satisfactorily explaining the delay in filing these items. If the petition is granted, the application would be accorded a filing date as of the date of deposit of the request for a section 1.60 application. No specific provision allowing this relief was previously in the rules. Paragraph (c) is added to set forth the procedure which the Office uses to notify an applicant that an application filed under paragraph (b) is incomplete and the handling fee which is deducted from the amount refunded if an application is not completed after notice to do so has been given.

Section 1.62, paragraph (e), is amended to specifically state that changes to the prior application must be made by an amendment to the prior application filed in the application under section 1.62. An application which includes a copy of the prior application or a new specification is improper under the rule and is not accorded the date of deposit as the filing date unless a petition is filed and granted. This specific statement will hopefully eliminate errors by applicants. The paragraph establishes a procedure whereby such an error can be excused upon the filing of a petition with instructions to cancel the copy or specification. If the petition is granted, the application will be accorded a filing date as of the date of deposit of the request for a section 1.62 application. Paragraph (j) sets forth the procedure which the Office uses to notify the applicant that an application filed under the section is improper and the handling fee which is deducted from the amount refunded if an application is not corrected after notice to do so has been given.

Section 1.96 is amended to indicate that a copy of the microfiche appendix with computer program listings in an application is a part of the file wrapper and contents available for purchase after a patent based on the application is granted or the application is otherwise made publicly available.

Other Considerations

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. Sections 3501 et seq. This rule involves information collection requirements subject to the Paperwork Reduction Act and approved by the Office of Management and Budget under Control No. 0651-0011.

The Office has determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L 96-354).

The Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and recordkeeping requirements, Small businesses.

For the reasons given in the preamble and pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 41, and Public Law 97-247, the Office is amending Title 37 of Code of Federal Regulations as set forth below.

Part 1 Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Section 1.17 is amended by revising paragraph (i)(1) to read as follows:

§ 1.17 Patent application processing fees.

* * * * *

(i)(1) For filing a petition to the Commissioner under a section of this part listed below which refers to this paragraph $120.00

§ 1.12-for access to an assignment record.
§ 1.14-for access to an application.

§ 1.53-to accord a filing date.
§ 1.55-for entry of late priority papers.
§ 1.60-to accord a filing date.
§ 1.62-to accord a filing date.
§ 1.103-to suspend action in application.
§ 1.177-for divisional reissues to issue separately.
§ 1.312-for amendment after payment of issue fee.
§ 1.313-to withdraw an application from issue
§ 1.314-to defer issuance of a patent.
§ 1.334-for patent to issue to assignee, assignment recorded late.
§ 1.666(b)-for access to interference settlement agreement.

* * * * *

3. Section 1.21 is amended by adding paragraph (n) to read as follows:

§ 1.21 Miscellaneous fees and charges.

* * * * *

(n) For handling an incomplete or improper application under § 1.53(c), § 1.60 or § 1.62 ..... $20.00.

4. Section 1.53 is amended by revising paragraphs (b) and (c) to read as follows:

§ 1.53 Serial number, filing date and completion of application.

* * * * *

(b) The filing date of an application for patent filed under this section is the date on which: (1) a specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75; and (2) any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41. No new matter may be introduced into an application after its filing date (§ 1.118). If all the names of the actual inventor or inventors are not supplied when the specification and any required drawing are filed, the application will not be given a filing date earlier than the date upon which the names are supplied unless a petition with the fee set forth in § 1.17(i)(1) is filed which sets forth the reasons the delay in supplying the names should be excused. A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and § 1.78(a)) may be filed pursuant to this section, § 1.60 or § 1.62. A continuation-in-part application may be filed pursuant ot this section or § 1.62.

(c) If any application is filed without the specification, drawing or name, or names, of the actual inventor or inventors required by paragraph (b) of this section, applicant will be so notified and given a time period within which to submit the omitted specification, drawing, name, or names, of the actual inventor, or inventors, in order to obtain a filing date as of the date of filing of such submission. A copy of the "Notice of Incomplete Application" form notifying the applicant should accompany any response thereto submitted to the Office. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n).

* * * * *

5. Section 1.55 is amended by revising paragraph (a) to read as follows:

§ 1.55 Claim for foreign priority.

(a) An applicant may claim the benefit of the filing date of a prior foreign application under the conditions specified in 35 U.S.C. 119 and 172. The claim to priority need be in no special form and may be made by the attorney or agent if the foreign application is referred to in the oath or declaration as required by § 1.63. The claim for priority and the certified copy of the foreign application specified in the second paragraph of 35 U.S.C. 119 must be filed in the case of an interference (§ 1.630); when necessary to overcome the date of a reference relied upon by the examiner; or when specifically required by the examiner; and in all other cases they must be filed not later than the date the issue fee is paid. If the papers filed are not in the English language, a translation need not be filed except in the three particular instances specified in the preceding sentence, in which event a sworn translation or a translation certified as accurate by a sworn or official translator must be filed. If the priority papers are submitted after the date the issue fee is paid, they must be accompanied by a petition requesting their entry and the fee set forth in § 1.17(i)(1).

* * * * *

6. Section 1.60 is amended by removing and reserving paragraph (a) and revising paragraph (b) and adding new paragraph (c) to read as follows:

§ 1.60 Contunuation or divisional application for invention disclosed in a prior application.

(a) [RESERVED]

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and § 1.78(a)) if (1) the prior application was a complete application as set forth in § 1.51(a), (2)applicant indicates that the application is being filed pursuant to this section and files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration showing the signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application, (3) the inventors named in the continuation or divisional application are the same or less than all the inventors named in the prior application, and (4) the application is filed before the patenting or abandonment of or termination of proceedings on the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§ 1.78(a)) will be entered before calculating the filing fee and granting the filing date. If the continuation or divisional application is filed by less than all the inventors named in the prior application, a statement must accompany the application when filed requesting deletion of the names of the person or persons who are not inventors of the invention being claimed in the continuation or divisional application. If a true copy of the prior application as filed is not filed with the application or if the statement that the application papers are a true copy is omitted, the application will not be given a filing date earlier than the date upon which the copy and statement are filed, unless a petition with the fee set forth in § 1.17(i)(1) is filed which satisfactorily explains the delay in filing these items.

(c) If an application filed pursuant to paragraph (b) of this section is incomplete, applicant will be notified and given a time period within which to complete the application in order to obtain a filing date as of the date of filing the omitted item provided the omitted item is filed before the patenting or abandonment of or termination of proceedings on the prior application. If the omission is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n).

7. Section 1.62 is amended by revising paragraph (e) and by adding a new paragraph (j) to read as follows:

§ 1.62 File wrapper continuing procedure.

* * * * *

(e) An application filed under this section will utilize the file wrapper and contents of the prior applcation to constitute the

new continuation, continuation-in-part, or divisional application but will be assigned a new application serial number. Changes to the prior application must be made in the form of an amendment to the prior application as it exists at the time of filing the application under this section. No copy of the prior application or new specification is required. The filing of such a copy or specification will be considered improper, and a filing date as of the date of deposit of the request for an application under this section will not be granted to the application unless a petition with the fee set forth in § 1.17(i)(1) is filed with instructions to cancel the copy or specification.

* * * * *

(j) If any application filed under this section is found to be improper, the applicant will be notified and given a time period within which to correct the filing error in order to obtain a filing date as of the date the filing error is corrected provided the correction is made before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application. If the filing error is not corrected within the time period set, the application will be returned or otherwise disposed of; the fee, if submitted, will be refunded less the handling fee set forth in § 1.21(n).

8. Section 1.96 is amended by revising paragraph (b)(1) to read as follows:

§ 1.96 Submission of computer program listings.

* * * * *

(b) * * *

(1) *Availability of appendix.* Such computer program listings on microfiche will be available to the public for inspection, and microfiche copies thereof will be available for purchase with the file wrapper and contents, after a patent based on such application is granted or the application is otherwise made publicly available.

* * * * *

Nov. 6, 1989 JEFFERY M. SAMUELS
Acting Commissioner of Patents and Trademarks

PATENT NOTICES

Certificates of Correction For Week of December 5, 1989

Plt. 6,714	4,798,486	4,811,681	4,821,658
Plt. 6,759	4,798,635	4,811,790	4,822,364
Plt. 6,796	4,798,721	4,812,192	4,823,239
4,498,430	4,799,948	4,812,207	4,823,683
4,593,282	4,799,951	4,812,222	4,823,784
4,629,742	4,800,413	4,812,469	4,823,878
4,661,902	4,801,087	4,812,532	4,823,933
4,663,594	4,801,402	4,812,870	4,824,145
4,679,206	4,801,447	4,813,258	4,824,156
4,684,556	4,802,126	4,814,638	4,825,889
4,694,090	4,802,949	4,814,740	4,825,922
4,698,645	4,803,277	4,815,570	4,826,323
4,708,045	4,803,435	4,815,666	4,826,882
4,720,971	4,805,217	4,816,072	4,826,890
4,724,397	4,805,612	4,816,489	4,827,094
4,727,035	4,805,708	4,816,605	4,827,482
4,728,812	4,806,913	4,816,933	4,827,701
4,743,375	4,807,619	4,817,060	4,828,108
4,744,990	4,808,356	4,817,163	4,828,695
4,746,717	4,808,359	4,817,337	4,828,906
4,754,097	4,808,377	4,817,938	4,829,053
4,773,967	4,808,388	4,818,388	4,829,739
4,782,982	4,808,439	4,818,594	4,829,944
4,783,728	4,808,859	4,819,117	4,830,081
4,786,701	4,809,663	4,819,746	4,830,413
4,788,214	4,809,884	4,819,901	4,830,656
4,788,619	4,809,900	4,820,644	4,838,296
4,790,885	4,810,453	4,820,676	4,842,804
4,791,122	4,810,547	4,820,935	4,846,821
4,795,584	4,811,267	4,821,244	4,866,024
4,796,704	4,811,289	4,821,545	4,877,770
4,797,956	4,811,407		

Disclaimers

Des. 301,688.—*Richard D. Green*, Santa Monica, Calif. DUAL COMPARTMENT BOTTLE. Patent dated June 20, 1989. Disclaimer filed Sept. 8, 1989, by the inventor.

Hereby enters this disclaimer to the entire term of said patent.

4,660,556.—*Casimir Swinger*, New York, N. Y.; *Daniel Cassiday*, Jersey City, N.J. METHOD AND APPARATUS FOR MODIFYING CORNEAL BUTTONS. Patent dated Apr. 28, 1987. Disclaimer filed Sept. 29, 1989, by the inventors.

Hereby enters this disclaimer to claims 6, 8/6, 9/6, 10/6, 11/6, 12, 14, and 17 of said patent.

4,800,200.—*John J. Tegeler*, Bridgewater; *Kirk D. Shoger*, Piscataway, both of N. J. 4,8-DIHDRO-8-ARYLI-SOXAZOLO[4,3-E] [1,4]-OXAZEPIN-5-(6H)-ONES. Patent dated Jan. 24, 1989. Disclaimer filed Sept. 15, 1989, by the assignee, Hoechst-Roussel Pharmeceuticals, Inc.

Hereby enters this disclaimer to claims 10 to 17 of said patent.

Disclaimer and Dedication

4,689,177.—*Neil E. S. Thompson; Robert G. Asperger*, both of St. Louis, Mo. USE OF TRIDITHIOCARBAMIC ACID COMPOSITIONS AS DEMULSIFIERS. Patent dated Aug. 25, 1987. Disclaimer and Dedication filed Oct. 2, 1989, by the assignee, Petrolite Corp.

Hereby disclaims and dedicates to the Public the entire term of said patent.

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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF October 21, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director 5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director 6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director 4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director 5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director 1-20-87

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director 10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director 2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director 5-28-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director 5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director 8-18-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director 9-21-87
DESIGN, GROUP 290—K. L. CAGE, Director 2-6-86

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director 10-21-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director 4-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director 4-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director 2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director 1-3-89

Expiration of patents: The patents within the range of numbers indicated below expire during October 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,694,814 to 3,702,011 inclusive
Plant Patents ..... None

STATUTORY INVENTION REGISTRATIONS

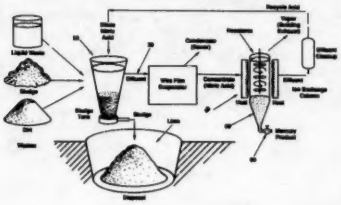
PUBLISHED DECEMBER 5, 1989

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H715
RECOVERY OF MERCURY FROM ACID WASTE RESIDUES

Wilbur O. Greenhalgh, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 27, 1987, Ser. No. 19,834
Int. Cl.[4] C22B *3/00*
U.S. Cl. 75—109 **4 Claims**



1. In a process wherein a nuclear fuel element, with a cladding comprising aluminum, is subjected to a reaction with a solution comprising water, nitric acid and mercury nitrate in a reaction vessel, and wherein mercury acts as a catalyst, a method for receiving metallic mercury from said solution, comprising the steps of:

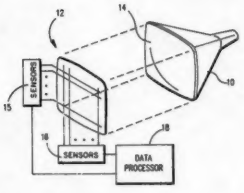
first, reacting said cladding to dissolve said aluminum, whereby mercury nitrate is caused to be converted to metallic mercury; and

second, removing said metallic mercury from said reaction vessel prior to re-nitration of said mercury by said nitric acid.

H716
PARALLAX INDUCED POINTING ERROR AVOIDANCE METHOD AND MEANS FOR SYSTEMS USING TOUCH SCREEN OVERLAYS

James E. McDonald, 5184 Tellbrook Ct., Las Cruces, N. Mex. 88001, and Jimmy D. Stone, 2807 Humboldt Cir., Longmont, Colo. 80501

Filed Nov. 16, 1987, Ser. No. 121,024
Int. Cl.[4] G09G *3/02*
U.S. Cl. 340—712 **6 Claims**



1. The process of compensating for parallax-induced errors associated with use of an electronically generated visual display which is viewed through a medium that is prone to causing apparent image displacement from parallax distortion and wherein touching by the user of one or more discrete areas causes actuation of a touch responsive means, comprising the steps of:

determining the amount of offset distance of visually apparent shift caused by parallax from viewing said medium at a preselected maximum angle relative to the display surface;

assigning a guard band around at least a portion of the perimeter of each area of the electronically-generated visual display which is to receive selected touch actuation with said guard band

having a width for extending the perimeter of said touch selected area by an amount correlated to said determined offset distance caused by said parallax distortion; and

responding to touching within said guard band by generating a signal for indicating to the touch responsive means that the said discrete area adjacent to said guard band was touched.

H717
HIGH BURN RATE AMMONIUM PERCHLORATE PROPELLANT

William D. Stephens, Huntsville, and Larry C. Warren, Madison, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 12, 1988, Ser. No. 243,539
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.2 **2 Claims**

1. A solid propellant composition comprising:

(i) a trimodal mix of particle sizes 200, 1.7, and 0.7 microns of ammonium perchlorate oxidizer in an amount from about 66 to about 70 weight percent, said trimodal mix having a major portion of said 1.7 and 0.7 micron particle sizes with the remainder of said weight percent being 200 micron particle size;

(ii) hydroxyterminated polybutadiene binder system in an amount from about 9 to about 10 weight percent, said hydroyx-terminated polybutadiene binder system including an isocyanate curative added in an amount of up to about 1.0 weight percent and optional modifiers in small amounts with adjustment of the weight of other ingredients;

(iii) aluminum metal powder from about 18 to 20 weight percent; and,

(iv) a burning rate enhancer of 2,2-bis(t-butyldicylopentadienyliron)propane in amount from about 2 to about 6 weight percent.

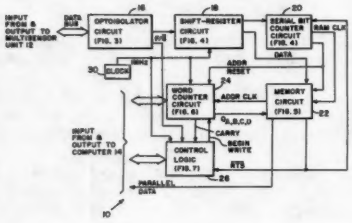
H718
MULTI-SENSOR BUFFER INTERFACE

Troy L. Hester, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 19, 1988, Ser. No. 287,741
Int. Cl.[4] H03K *21/08*
U.S. Cl. 377—114 **2 Claims**

1. In a data transfer system, wherein data arranged in serial format must be processed in parallel data format, a buffer interface for converting the data from serial to parallel format comprising: a shift register circuit for receiving data in serial format and outputing data in parallel format, a serial bit counter circuit a random access memory circuit, a clock coupled to said shift register circuit for providing synchronization signals thereto, said serial bit counter circuit being disposed in

series between said shift register circuit and said memory circuit for clocking the memory circuit in response to clock synchronization signal inputs from said shift register circuit,



said parallel data output of said shift register circuit being coupled directly to said memory circuit, said memory circuit having plural outputs disposed for coupling data in parallel format to using circuitry.

H719

PREPARATION OF SPHEROIDAL 3-NITRO-1,2,4-TRIAZOL-5-ONE BY CRYSTALLIZATION

Steven L. Collignon, Waldorf, and Robert Farncomb, Accokeek, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 12, 1989, Ser. No. 379,035

Int. Cl.[4] **C07D** *249/12, 249/16, 403/00, 487/00*

U.S. Cl. 548—265 **4 Claims**

1. A process for producing spheroidal crystals of 3-nitro-1,2,4-triazol-5-one comprising the following steps in order:

(1) completely dissolving 3-nitro-1,2,4-triazol-5-one in water containing from 0.01 to 0.20 weight percent of a fluorochemincal surfactant and from 0.01 to 0.20 weight percent of methyl cellulose at a temperature of from 60° C. to less than the boiling point of water at ambient pressure;

(2) cooling the aqueous solution formed in step (1) at a rate of from 6° C./minute to 20° C./minute while the solution is agitated until the solution is at a temperature of from 0° C. to 10° C.; and

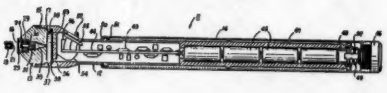
(3) isolating the product spheroidal crystals of 3-nitro-1,2,4-triazol-5-one.

REEXAMINATIONS

DECEMBER 5, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,250,759 (1162nd)
DIGITAL READOUT
Otto Z. Vago, Burns, and Frank S. Irlinger, Nashville, both of Tenn., assignors to Schrader Automotive, Inc.
Reexamination Request No. 90/001,748, Apr. 7, 1989.
Reexamination Certificate for Patent No. 4,250,759, issued Feb. 17, 1981, Ser. No. 96,501, Nov. 21, 1979.
Continuation-in-part of Ser. No. 3,506, Jan. 15, 1979, abandoned, which is a continuation of Ser. No. 850,036, Nov. 9, 1977, abandoned.
Int. Cl.[4] B60C *23/02*; G01L *7/08, 9/08*
U.S. Cl. 73—273



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **7–9** are cancelled.

Claims **1–6** and **10–21** are determined to be patentable as amended.

New claims **22–24** are added and determined to be patentable.

1. A digital readout *tire pressure* gauge, comprising, in combination,

a housing,

a chamber in said housing,

wall means in said chamber movable with changes of force on said wall means,

means to apply a changeable force on said wall means[,] *including means to apply a fluid pressure to said chamber,*

a standard adaptor in one end of said chamber and having a central deflator projection positioned to depress and open a valve core of a tire valve upon application of the adaptor to the tire valve,

an electrical circuit in said housing,

a battery in said housing and connected to supply power to said electrical circuit,

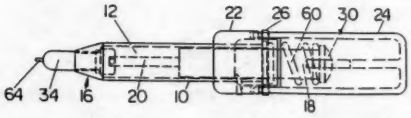
said electrical circuit including a transducer mounted to be stressed in accordance with movement of said moveable wall means,

output conductors connected to said transducer to generate an analog voltage thereacross upon stressing of said transducer,

an analog-to-digital converter connected to receive a voltage in accordance with [te] *the* voltage on said output conductors to convert the analog signal of said transducer voltage output into a digital signal,

and a digital readout display connected to the output of said converter to display a digital value in accordance with the transducer voltage output.

B2 4,330,280 (1163rd)
EJECTOR HOLDER FOR CAPSULE-LIKE CARTRIDGE
Emery W. Dougherty, and Richard E. Welsh, both of Milford, Del., assignors to Dentsply Research Development Corp., Milford, Del.
Reexamination Request No. 90/000,880, Oct. 10, 1985.
Reexamination Certificate for Patent No. 4,330,280, issued May 18, 1982, Ser. No. 252,558, Apr. 9, 1981.
Reexamination Certificate B1 4,330,280, issued Nov. 5, 1985.
Int. Cl.[4] A61C *5/04*
U.S. Cl. 433—90



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claim **5** is cancelled.

Claims **2**, **3** and **4**, dependent on an amended claim, are determined to be patentable.

New claims **6**, **7**, **8**, **9**, **10**, **11** and **12** are added and determined to be patentable.

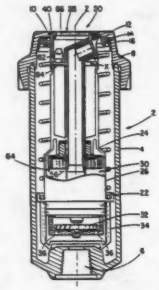
1. A manually operable ejector holder and a loaded capsule-like cartridge in which said cartridge has an annular collar on one end [and] , a discharge tip on the other, [and] *end, and an intermediate body portion in between,* said holder comprising in combination, an elongated barrel *having an interior bore,* a plunger reciprocable therein and one end projecting beyond said barrel, manually operable lever means on one end of said barrel operable to reciprocate said plunger relative to the other end of said barrel, and said other end of the barrel being cut-away longitudinally a limited distance to provide a compartment having side walls extending a limited distance beyond the axis of said barrel, an undercut groove formed *forward of said interior bore and rearwardly* in said compartment within said sidewalls to receive the annular collar on said cartridge to prevent relative axial movement between said cartridge and compartment, and the outer longitudinally-extending portions of the sidewalls of said compartment having limited flexibility and extending toward each other a slightly lesser distance than the diameter of said cartridge *intermediate body portion* to effect a snap-acting retaining means for said cartridge when inserted into said compartment, *said retaining means extending longitudinally a distance forward of said undercut groove substantially greater than the longitudinal length of said annular collar to hold a substantial portion of said cartridge intermediate body portion.*

B1 4,634,052 (1164th)

ADJUSTABLE ARC SPRINKLER HEAD

Glen Grizzle, Corona; Stephen L. Tyler, Diamond Bar, both of Calif., and Joseph J. Walto, Chaska, Minn., assignors to The Toro Company

Reexamination Request No. 90/001,574, Aug. 8, 1988.
Reexamination Certificate for Patent No. 4,634,052, issued Jan. 6, 1987, Ser. No. 668,347, Nov. 5, 1984.
Int. Cl.[4] B05B *15/10*
U.S. Cl. 239—205



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1**, **2** and **6–9** is confirmed.

Claim **3** is determined to be patentable as amended.

Claims **4** and **5**, dependent on an amended claim, are determined to be patentable.

3. An improved adjustable arc [spinkler] *sprinkler head of the type having a housing; a rotatable nozzle assembly carried by the housing which rotates about a substantially vertical axis to water an arc segment between first and second limits; drive means for rotating the nozzle assembly in first and second directions and for reversing the direction of rotation at each of the arc segment limits, wherein the drive means includes a driven member secured to the nozzle assembly; an adjustment member having means for coupling the adjustment member to the driven member for rotation therewith, wherein the relative rotational adjustment between the driven member and the adjustment member determines the distance between the first and second limits of the arc segment, and wherein the improvement comprises:*

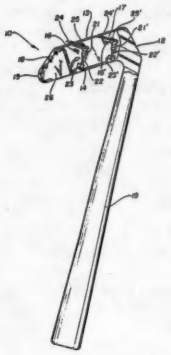
means responsive to movement of the nozzle assembly along the vertical axis for unlocking the adjustment member from the driven member to allow relative rotation between the two *without disassembling the nozzle assembly from the housing*, whereby the extent of the arc segment being watered may be adjusted.

B1 4,709,477 (1165th)

BLADE ASSEMBLY FEATURING VARIABLE SPAN

Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Reexamination Request No. 90/001,709, Feb. 6, 1989.
Reexamination Certificate for Patent No. 4,709,477, issued Dec. 1, 1987, Ser. No. 902,715, Sep. 2, 1986.
Int. Cl.[4] B26B *21/22*
U.S. Cl. 30—50



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

1. A blade assembly comprising in combination:

(a) a frame with an essentially flat bottom portion, a front portion and a back portion both portions extending upward from said bottom portion, a hollow central portion defined at either side by inner faces of said front and back portion, said front portion including a guard bar formed on the top of said portion;

(b) a first blade support mounted on said bottom portion and extending upward to support a first blade, said blade support including pivoting means which allows pivotal movement of the first blade along a predetermined arcuate path to change the span of said first blade in response to pressures exerted during shaving; and

(c) a second blade support mounted on said bottom portion and extending upward to support a second blade, said blade support including pivoting means which allows pivotal movement of the second blade along a predetermined arcuate path to change the span of said second blade independent of the change in span of said first blade.

REISSUES

DECEMBER 5, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

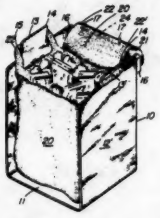
Re. 33,122
APPARATUS FOR LOADING BAGS

William G. Orem, Clifton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Original No. 40,621,708, dated Dec. 13, 1977, Ser. No. 778,406, Mar. 17, 1977. Continuation of Ser. No. 734,247, May 14, 1985, abandoned, which is a continuation of Ser. No. 452,472, Dec. 23, 1982, abandoned, which is a continuation of Ser. No. 102,815, Dec. 12, 1979, abandoned. Application for reissue Feb. 28, 1986, Ser. No. 836,225

Int. Cl.[4] B65B *67/12, 1/04*

U.S. Cl. 53—459 49 Claims



23. An apparatus that facilitates the loading of articles in an open mouth plastic bag having integral handle loops disposed on opposite sides of the mouth thereof, whereby said bag is suspended within said apparatus and held in open position by means of said handles, said apparatus comprising:

a. a first elongated fixed tab means upwardly projecting from a first support means;

b. a second elongated fixed tab means upwardly projecting from a second support means fixedly and immovably spaced apart from said first support means at substantially the same height as the first tab means; said first and second support means, together with said tab means, being adapted to maintain said bag, suspended therefrom by said handles, in an open position;

c. each of said tab means having a rearwardly directed protrusion at one end portion thereof adapted to retain said bag handles on said tab means when said bag is suspended in said apparatus; and

d. rearwardly located means for holding a stack of said plastic bags between first and second support means.

26. A method of loading articles in an open mouth plastic bag having integral handle loops disposed on opposite sides of the mouth in an apparatus comprising a first elongated tab means upwardly projecting from a first support means, a second elongated tab means upwardly projecting from a second support means fixedly and immovably spaced apart from said first support means at substantially the same height as said first support means, said first and second support means together with said tab means being adapted to maintain said bag suspended therefrom by said handles in an open position, said tab means comprising rearwardly directed protrusions adapted to retain said bag handles on said tab means when said bag is suspended in said apparatus, and rearwardly located means for holding a stack of said plastic bags, said apparatus being adapted to be positioned above a substantially horizontal support surface to support the bottom of said bag during loading; comprising the steps of:

a. locating a stack of plastic bags on said holding means,

b. removing the topmost bag from said stack by grasping its handles, holding one handle in each hand,

c. opening the handle area,

d. placing each handle over a respective one of said tab means,

e. loading said bag, and

f. lifting said handles from said tab means to remove said bag from said apparatus.

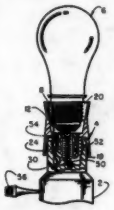
Re. 33,123
LAMP SOCKET

John A. Corsetti, Port St. Lucie, Fla., assignor to Dennis L. Johnson, Jensen Beach, Fla.

Original No. 4,548,449, dated Oct. 22, 1985, Ser. No. 567,186, Dec. 30, 1983. Application for reissue Oct. 20, 1987, Ser. No. 110,375

Int. Cl.[4] H01R *13/02*

U.S. Cl. 439—628 14 Claims



9. A spring insert lamp socket comprising:

a hollow cylindrical member open at one end thereof and made of electrically non-conductive material,

a transverse partition made of electrically non-conductive material located at the opposite end of said cylindrical member from said open end,

a bore centrally through said partition,

a contact member made of electrically conductive material positioned in said bore, said contact member including a spiral spring and a screw threaded into one end of said spring, spiral spring and a screw threaded into one end of said spring, the head of said screw being larger than the diameter of said bore whereby said contact member is captive and adjustable within said bore, and

a first conductor member made of electrically conductive material and extending through said partition and extending along the inside surface of said cylindrical member and structured to engage the threads of a conventional screw base light bulb inserted into said cylindrical member so as to allow electrical current to pass from the said contact member through the filament in said bulb and to said first conductor member.

Re. 33,124
WATER-BASED INDUSTRIAL FLUIDS

Haimi N. Singer, Sandton, South Africa, assignor to Singer and Hersch Industrial Development (PTY) Ltd., South Africa

Original No. 4,257,902, dated Mar. 24, 1981, Ser. No. 819,724, Jul. 27, 1977. Continuation of Ser. No. 477,981, Mar. 23, 1983, abandoned. Application for reissue Sep. 12, 1986, Ser. No. 907,145

Claims priority, application South Africa, Aug. 4, 1976, 76/4685; Sep. 28, 1976, 76/5792; Sep. 28, 1976, 76/5793; Sep. 28, 1976, 76/5794; Nov. 26, 1976, 76/7076; Nov. 26, 1976, 76/7077; Feb. 21, 1977, 77/1013

Int. Cl.[4] C10M *173/00*

U.S. Cl. 252—18 35 Claims

1. A substantially oil-free aqueous *emulsion-free* composition

of matter useful as a lubricant or functional liquid comprising (A) a major amount of water including up to as much as 99.9 percent by weight of water, (B) a minor *but effective* amount of at least one substantially water-insoluble, oil-soluble functional additive stably dispersed therein, wherein the functional additive (B) is a sulfur- or chlorosulfur-containing E.P. agent or mixture of two or more of these, (C) a minor *but effective* amount of at least one substantially water-soluble, liquid organic dispersing agent, said dispersing agent being capable of *dissolving said functional additive and* stably dispersing said functional additive in said aqueous composition [and wherein (D) at least one water-soluble polymeric thickener for said aqueous composition is present] *and (D) at least one water soluble polymeric thickener for said aqueous composition, said composition of matter being formed by premixing (B) and (C) and then mixing with the other components.*

Re. 33,125

3- AND 5-[3-(1-ARYLUREIDO)]-1,2,4-TRIAZOLES

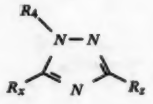
Henry F. Campbell; Thomas H. Scholtz, both of Lansdale, and George H. Douglas, Malvern, all of Pa., assignors to Rorer Pharmaceutical Corporation, Ft. Washington, Pa.

Original No. 44,605,855, dated Jul. 17, 1984, Ser. No. 458,451, Jan. 17, 1983. Continuation-in-part of Ser. No. 280,816, Jul. 6, 1981, abandoned. Application for reissue Jul. 11, 1986, Ser. No. 884,765

Int. Cl.[4] **A61K** *31/41, 31/415, 31/425, 31/44, 31/42, 31/445, 31/495, 31/505, 31/535, 31/54;* **C07D** *249/14, 401/04, 401/14, 401/12, 403/04, 403/12, 403/14, 407/04, 407/14, 407/12*

U.S. Cl. 514—383 **6 Claims**

8. A method of lowering blood pressure in humans and other animals, comprising administering thereto an effective blood pressure lowering amount of a compound of the formula [according to claim 1



wherein:

R_x and R_z are either $NHC(X)NHR_1$ or R_6, provided that R_x and R_z are not both either $NHC(X)NHR_1$ or R_6;

X is oxygen or sulfur;

R_1 is phenyl or substituted phenyl;

R_4 is hydrogen, lower alkyl, lower alkanoyl, carboloweralkoxy, phenyl, or benzoyl;

R_6 is hydrogen or lower alkyl; and wherein:

substituted phenyl means a phenyl group in which one or more of the phenyl hydrogens has been replaced by the same or different substituents selected from the group consisting of halo, lower alkyl, halo lower alkyl, amino, lower alkanoyl, lower alkyl acylamino, hydroxy, carboloweralkoxy, phenyl lower alkoxy, lower alkyl acyloxy, cyano, halo lower alkoxy or lower alkyl sulfonyl;

or a pharmaceutically acceptable acid addition salt thereof.

PLANT PATENTS

GRANTED DECEMBER 5, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,061

ROSE PLANT/MORCHERMAG

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Oct. 3, 1988, Ser. No. 252,905
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of minature rose plant of hardy, dwarf, bushy, rounded to upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of medium to deep red color which is modified by lighter red veining or undercolor; the bud and flower resembling the variety Lavender Jewel (U.S. Plant Pat. No. 4,480) in form and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings or by budding, with an abundance of small to medium size semi-glossy to matt foliage and an abundance of flowers borne both singly and in loose clusters of 3 to 5 or more.

7,062

FLOWERING CRAB APPLE TREE NAMED SUTYZAM

James W. Zampini, 5052 S. Ridge Rd., Box 122, Perry, Ohio 44081

Filed Oct. 18, 1988, Ser. No. 259,070
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of flowerly Malus crab apple tree, substantially as herein shown and described, characterized particularly by a combination of a profusion of annual bloom and extremely long-persisting, highly-ornamental fruit.

7,063

APPLE TREE "GINGER GOLD"

Clyde H. Harvey, Lovingston, Va., assignor to Adams County Nursery, Inc., Aspers, Pa.

Filed Dec. 7, 1988, Ser. No. 280,749
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree originating as a chance seedling in a Winesap apple block, substantially as herein shown and described characterized particularly as to novelty by the early season of its maturity, the smooth, glossy, brilliant yellow green skin color on the fruit, very long storage life of said fruit, and the unique combination of characteristics which are very different from other yellow green apple cultivars.

7,064

NECTARINE TREE (FIRE DIAMOND)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Jan. 6, 1989, Ser. No. 294,104
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct very early ripening variety of semi-freestone nectarine tree, substantially as illustrated and described, which most nearly resembles the Early Diamond (U.S. Plant Pat. No. 5,438) nectarine variety by producing fruit that is good in flavor, globose in shape, and almost full red in color at harvest time, but is distinguished therefrom and an improvement thereon by harvesting 21 days earlier, making it one of the earliest ripening nectarines presently known, and is further distinguished from the Early Diamond by having purplish red blossoms instead of pink blossoms and by having mostly reddish brown leaves instead of green leaves from mid-summer to dormancy.

7,065

PEACH TREE "ARTIC GEM"

Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Dec. 23, 1988, Ser. No. 290,509
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—42 1 Claim

1. A new and distinct variety of peach tree substantially as illustrated and described, which is of large size, vigorous, upright growth and a regular and productive bearer of large, firm, white flesh, freestone fruit with good flavor and eating quality; the fruit is further characterized in comparison to Giant Babcock Peach (U.S. Plant Pat. No. 1,353) as having firmer white flesh and greater shipping and storage quality, a higher degree of attractive red skin color and maturing 5 to 6 days later.

7,066

PEACH TREE (DIAMOND PRINCESS)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Jan. 6, 1989, Ser. No. 294,103
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—43 1 Claim

1. A new and distinct early to mid-season ripening variety of freestone peach tree, substantially as illustrated and described, which most nearly resembles the Redtop (not patented) peach variety by producing fruit that is freestone in type and ripens in late June, but is distinguished from and an improvement on that variety by having fruit that is more fully red in color at harvest time, more globose in shape, and much firmer in texture, all valuable assets for commercial long distant shipping peach varieties.

7,067

RED RASPBERRY 'WATSON'

John C. Sanford, and Jack E. Reich, both of Geneva, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 28, 1988, Ser. No. 264,551
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—46 1 Claim

1. The new and distinct variety of red raspberry herein described, illustrated, and identified by the characters enumerated above.

PATENTS

GRANTED DEC. 5, 1989

ERRATA

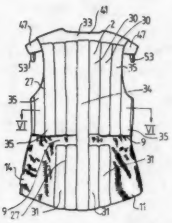
For CLASS	See PATENT NO.
137-614	4,884,584
356-360	4,884,697
433-116	4,884,968
156-057	4,885,037
156-089	4,885,038
156-294	4,885,039
156-244	4,885,040
376-203	4,885,122
376-233	4,885,123
376-260	4,885,124
514-002	4,885,163
424-095	4,885,177
524-281	4,885,318
525-424	4,885,328
546-216	4,885,367
323-315	4,885,525
324-307	4,885,549
333-139	4,885,562
364-519	4,885,597
377-058	4,885,626
379-221	4,885,780
380-023	4,885,788
380-025	4,885,789
381-036	4,885,790
381-043	4,885,791
381-119	4,885,792

PATENTS

GRANTED DECEMBER 5, 1989

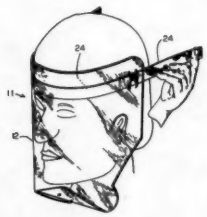
GENERAL AND MECHANICAL

4,884,295
PROTECTIVE GARMENT
Mary S. Cox, Lisnavilly House, Dundalk, County Louth, Ireland
Filed Nov. 14, 1988, Ser. No. 270,607
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 **20 Claims**



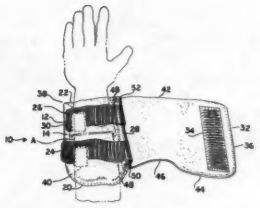
1. A protective garment for protecting the torso, the garment comprising;
a rear panel having an upper and a lower portion defining a waist therebetween,
an elongated spine protective member extending longitudinally of the rear panel from the upper portion to the lower portion across the waist to in use co-incide with at least portion of the spine of the wearer,
at least one main elongated impact absorbing member extending longitudinally of the rear panel on each side of the spine protective member, each main impact absorbing member comprising an upper and a lower elongated impact absorbing pad which define therebetween portion of the waist.

4,884,296
PROTECTIVE FACE SHIELD
Frank H. Nix, Jr., Gainesville, Ga., assignor to Delta Medical Systems, Inc., Alpharetta, Ga.
Filed Nov. 23, 1988, Ser. No. 275,717
Int. Cl.[4] A61F *9/00*
U.S. Cl. 2—011 **2 Claims**



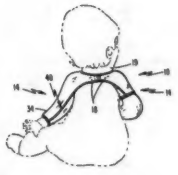
1. A protective face shield comprising a shield member of transparent flexible material, said member having an upper edge and first and second side edges joining said upper edge to form two corner regions,
said shield member further having a bottom edge displaced from the front of said shield member by a sloped portion of said shield member, said bottom edge being formed with a V-shaped notch therein,
a pair of slits formed in each of said corner regions of said shield member,
a headband slidably threaded through said pairs of slits and having first and second ends,
fastening means on said headband at the ends thereof, and
second fastening means on either side of said notch adjacent said bottom edge.

4,884,297
ARM PROTECTOR
Freddie J. Triche, 1537 Bernice St., Morgan City, La. 70380
Filed Dec. 16, 1988, Ser. No. 285,728
Int. Cl.[4] A41D *13/08*
U.S. Cl. 2—16 **7 Claims**



1. An arm protector for use in the welding trade or the like comprising, in combination;
an elongated pad insulating material having a top surface and and bottom surface,
means on said pad top surface for detachably mounting said pad on the arm of a user with said pad in underlying relationship therewith,
a laterally extending flap of insulating material attached to said pad, and
means for releasably securing said flap to said pad in overlying relationship with said pad and with the user's arm sandwiched therebetween whereby said arm is fully protected from heated surfaces and the like.

4,884,298
BABY FEEDING BIB
Cynthia L. Silas, 814 S. Dinwiddie St., Arlington, Va. 22204
Filed Sep. 2, 1988, Ser. No. 240,131
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 R **11 Claims**



1. A baby feeding bib, comprising:
(a) an apron-like member made of flexible material having a front surface and a rear surface, and including an upper edge shaped to fit the neck of a baby to be fed;
(b) attachment means on an upper end of said apron-like member for detachably connecting said member to the neck of the baby; and
(c) a pair of sleeves extending laterally from the apron-like member, at least one of said sleeves being defined by a length of material extending laterally from the apron-like

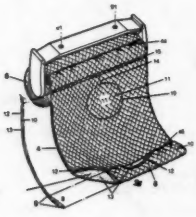
member between a pair of longitudinal seam edges, each seam edge having fastening means for engaging with the fastening means on the other seam edge to establish said sleeve encircling to cover the baby's arm, wherein said seam edges, in fastening engagement of said fastening means, define a closed seam located out of the baby's line of sight, wherein said closed seam faces rearwardly in relation to a front surface of the apron-like member covering the baby's chest, said closed seam thereby being located on the sleeve rearwardly of an imaginary plane passing vertically through the mid-section of the baby's shoulders and further including said fastening means being hook and loop tapes respectively arranged on opposing front and rear surfaces of the sleeve seam edges so that, in juxtaposed fastening contact, the uppermost seam edge faces downwardly to enable spilled foods to flow over the closed seam without entering between the seam edges and thereby soiling the fastening means.

4,884,299

DISPOSABLE BIBS, PACKAGING AND AFFIXING TABS

Connie Rose, 1821 Alta Vista Dr., Vista, Calif. 92083

Filed Mar. 8, 1985, Ser. No. 709,775
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 R **32 Claims**



1. A disposable bib comprising: a main body having two side edges, a top portion with a top edge, and a bottom portion with a bottom edge and having a series of layers comprising:

(1) a main layer of absorbant material,

(2) a central layer of moisture-impervious material housed within said absorbant main layer, and

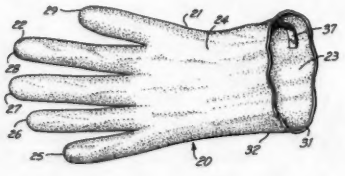
(3) a front layer of a gauze-like material on the front of said main layer, the front layer sealed as an integral part of said main layer.

4,884,300

GLOVE HAVING IMPROVED CUFF SECURING FEATURES

Maris Vistins, Santa Cruz, Calif., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 13, 1988, Ser. No. 243,580
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—162 **28 Claims**



1. A glove comprising:

a hollow flexible body member having an interior surface and an exterior surface, said body member including a closed distal end for containing the wearer's fingers, an open proximal end, and a cuff at said proximal end;

adhesive means on a tabless portion of said cuff for allowing said portion of said cuff to be removably secured to other portions of said cuff;

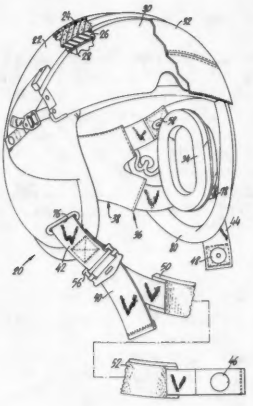
said adhesive means being positioned so that when said glove is properly positioned on the wearer's hand said cuff may be circumferentially gathered in a direction substantially tangent to said open proximal end causing said adhesive means to press against another portion of said cuff removably securing said adhesive means to the other portion of said cuff so that said cuff is more tightly secured to the wearer than before said adhesive means was removably secured to the other portion of said cuff.

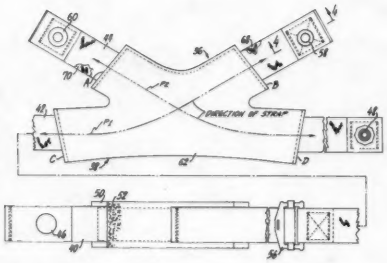
4,884,301

COMBINATION CHINSTRAP-NAPESTRAP ASSEMBLY FOR HELMET

Jackson A. Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.

Filed Jun. 13, 1988, Ser. No. 205,949
Int. Cl.[4] A42B *3/02, 7/00*
U.S. Cl. 2—42[illegible] **24 Claims**





1. A helmet assembly including in combination a shell, a pair of straps each having first and second ends, means for securing the first end of each of said straps to the rear of said shell on opposite sides thereof, means for interconnecting the second ends of said straps, means on each side of the front of said shell for receiving an intermediate portion of one of said straps, each of said straps being secured to the rear of said shell on one side

and being received at the front of said shell on the other side so as to cross the other strap in the nape area of said shell, means for retaining the crossing portions of said straps, and means independent of said straps for urging said retaining means toward the rear of said shell, said retaining means being movable into engagement with the nape of the wearer's neck upon tensioning of said straps against the action of said urging means.

4,884,302

SAFETY HELMET

Arthur Foehl, Auf der Halde 28, 7060 Schorndorf, Fed. Rep. of Germany

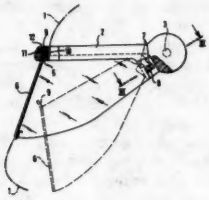
PCT No. PCT/DE86/00067, § 371 Date Jan. 12, 1987, § 102(e) Date Jan. 12, 1987, PCT Pub. No. WO86/04790, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 21, 1986, Ser. No. 19,219

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506495

Int. Cl.[4] A61F 9/00; A42B 3/02

U.S. Cl. 2—424 **13 Claims**



1. Safety helmet, particularly crash helmet for motorcycle drivers, with a helmet shell and a face shield for a face cut-out in the helmet shell, which face shield has a basically U-shaped shield frame with a retaining groove along an entire forward facing lower edge length, into which groove a similarly curved, transparent shield plate can be inserted and locked by means of a spring action notch element, characterized in that the shield plate (6) has swing hooks at both its lateral ends that are rotatably hooked into bearing points (8) of the shield frame (2) and the shield plate can be pivoted into the groove and locked via a notch opening (12) on the shield frame and the notch element (9) that is located at an upper edge of the shield plate between the lateral ends of the shield plate.

4,884,303

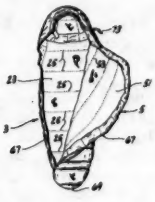
SLEEPING BAG

Michael J. Scherer, Boulder, Colo., assignor to American Recreation Products, Inc., New Haven, Mo.

Filed Mar. 10, 1988, Ser. No. 166,109

Int. Cl.[4] A47G 9/08

U.S. Cl. 5—413 **9 Claims**



1. A sleeping bag having a bottom portion, on which the user of the bag may lie, and an upper portion adapted to serve as a cover for the user, the cover comprising an upper and a lower section, and an elastically stretchable layer between said upper and lower sections of the cover operable to draw the lower section against the user in the bag to maintain it in relatively close form-fitting relation to the user;

each of the upper and lower sections of the cover having opposite side margins and comprising a layer of cushiony thermal insulation material, the elastically stretchable layer being sandwiched between said upper and lower sections of the cover extending from one side margin thereof to the other side margin thereof and secured in place at the side margins of the cover;

said elastically strechable layer being free of said sections between said side margins.

4,884,304

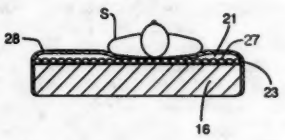
BEDDING SYSTEM WITH SELECTIVE HEATING AND COOLING

William Elkins, San Jose, Calif., assignor to Life Support Systems, Inc., Moutain View, Calif.

Filed Sep. 28, 1988, Ser. No. 250,778

Int. Cl.[4] A47C 21/04

U.S. Cl. 5—421 **16 Claims**



1. A bedding system for use in a bed for selective conductive cooling and heating of a person in the bed, comprising:

a mattress cover device adapted to lie over a mattress, with or without other bedding materials between, and beneath the person in the bed, the mattress cover device including liquid flow channel means for circulation of cooling/heating liquid, and a gas envelope space just above the liquid flow channel means, with a flexible, substantially gas-impermeable sheet covering the liquid flow channel means to form the gas envelope and with gas at slightly above atmospheric pressure in the gas envelope, such that when the person puts weight on an area of the mattress cover device, the flexible sheet comes into contact with the liquid flow channel means, effecting heat exchange with the person's skin, while leaving remaining portions of the flexible sheet above and out of contact with the liquid flow channel means thereby insulating the liquid in the flow channel means in such remaining portions, and

cooling/heating temperature control means connected to the liquid flow channel means for circulating the cooling/heating liquid through the liquid flow channel means as required and as selected by the person.

4,884,305

DEVICE FOR MAINTAINING BEDDING IN PLACE

Laura M. Blackmon, 420 San Saba, El Paso, Tex. 79912

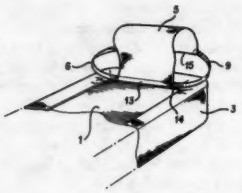
Filed Mar. 22, 1989, Ser. No. 327,107

Int. Cl.[4] A47G 9/04

U.S. Cl. 5—496 **7 Claims**

1. A device for maintaining bedding in position on a mattress comprising a single rectangular section of material folded along its longitudinal center line to form two halves, the respective pairs of adjacent corners of said section on opposite sides of said center line being joined by a pair of elongated elastic strips each of whose ends are joined to and extend from said adjacent corners parallel to said center line and are of sufficient length to extend under tension around the side of said

mattress from the top side to the underside to thereby hold said folded section of material in tight engagement with one end of



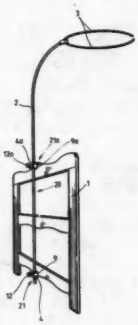
said mattress along with bedding placed thereon to prevent dislodgement thereof.

4,884,306

CLAMPING HOLDER FOR FIXING A SUPPORT ROD TO A CHILD'S BED

Kurt A. Goetz, Aumuehle Container Terminal, D-8700 Wurzburg, Fed. Rep. of Germany

Filed Feb. 7, 1989, Ser. No. 307,788
Int. Cl.[4] A47G *29/00*
U.S. Cl. 5—503 **8 Claims**



1. A clamping fixture for fixing a bed canopy or the like to the headboard of a bed or the like, comprising:

a U-shaped holding piece having a first side piece having an inner surface and a lower end, a second side piece having a threaded hole therethrough and a lower end, a web area connecting the lower end of the first side piece to the lower end of the second side piece, the web area having an oblong hole therethrough;

a clamping piece having a clamping surface a bottom surface perpendicular to the clamping surface and in sliding contact with the web area of the U-shaped holding piece, a hole therethrough with an axis parallel to the clamping surface and perpendicular to the bottom surface, a back surface parallel to the clamping surface;

a support rod extending through the hole in the clamping piece and the oblong hole in the holding piece; and,

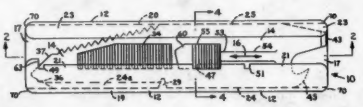
a means for urging the support rod and the clamping piece towards the first side piece to thereby clamp the headboard between the clamping surface and the inner surface and restrain the support rod.

4,884,307

POCKET TOOL

Ralph Flood, 3883 Sunbeam Dr., Los Angeles, Calif. 90065

Filed Sep. 2, 1988, Ser. No. 239,698
Int. Cl.[4] B25F *1/04*
U.S. Cl. 7—156 **28 Claims**



1. A pocket tool comprising an elongated hollow casing defining an internal slideway; a flat blade structure slidably positioned in said slideway for two way movement between a first storage position entirely within the casing, a second operating position wherein one of its end sections projects out of the casing; said one end section being configured to define a toothed saw, a cutting knife, a file, and a screw driver; and a third operating position wherein its other end section projects out of the casing; said other end section of the blade structure comprises a tip area that includes two straight convergent edges and an interconnecting flat nose which cooperatively define a flat blade screw driver; said other end section of the blade structure further comprising a first concave curved end edge extending from one of the aforementioned convergent edges for approximately two hundred fifty degrees, and a second convex curved edge extending from a longitudinal edge of the blade structure into convergence with the tip end of the concave end edge, said curved edges being contoured to cooperatively form a bottle cap opener; and a positive-acting latch means for releasably retaining the blade structure in each of its three adjusted positions; said latch means comprising three longitudinally spaced detents on the hollow casing, and a manually-depressible latch mechanism carried on the blade structure for selective interlocking engagement with said detents; said depressible mechanism comprising an elongated cantilever arm having a flexible hinge connection to the blade structure, and a thumb-operated protuberance carried on the free end of said arm for movement into end out of interlocking engagement with any one of said detents in response to thumb pressure activation forces.

4,884,308

PROCESS FOR DYEING TEXTILE WOVENS OR KNITS MADE OF POLYESTER FIBERS OR MIXTURES THEREOF WITH OTHER FIBERS IN JET DYEING MACHINES

Hans-Ulrich von der Eltz, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 21, 1988, Ser. No. 209,540
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1987, 3720697
Int. Cl.[4] D06B *3/28*
U.S. Cl. 8—149.1 **10 Claims**

1. In a process for the isothermal, batchwise dyeing of textile material made of polyester fibers or of mixtures thereof with other fibers in an aqueous medium with hot-fixable colorants by the exhaust technique, comprising the steps of circulating the textile material in the form of an endless rope in a jet dyeing machine, propelling the textile material within a self-contained jet range of the machine by the kinetic energy of a circulated gas stream which is introduced into the machine, adding the colorants in the form of an atomized liquid formulation to the circulating gas stream to thereby bring the colorant formulation into contact with the textile material, and controlling the temperature and pressure and conditions of the gas stream and the liquid colorant formulation, the improvement comprising metering the colorants as a liquid formulation of non-finished,

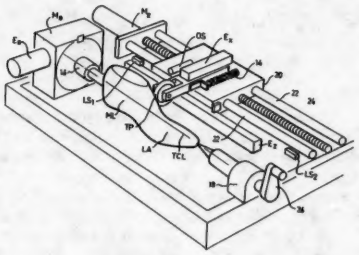
virtually water-insoluble or sparingly water-soluble dyes or pigments or of a mixture of both, in the form of a solution in one or more organic solvents, into the gas stream, precipitating the dissolved colorants in finely dispersed form on the textile material by exploiting the dilution effect brought on by the aqueous medium, and finally completing the dyeing under isothermal conditions.

4,884,309

METHOD AND APPARATUS FOR MAKING SHOE LASTS AND/OR SHOE COMPONENTS

Aharon Shafir, Leon Blum St. 9, Tel Aviv, Israel

Division of Ser. No. 109,297, Oct. 15, 1987, Pat. No. 4,817,222.
This application Oct. 12, 1988, Ser. No. 256,721
Int. Cl.[4] A43D *1/04, 1/00*
U.S. Cl. 12—1 R **4 Claims**



1. Digitizing apparatus, comprising:
a rotary motor for rotating a last about its longitudinal axis, constituting a first axis;
a first encoder producing an electrical output representing the instantaneous angular position of the model last about said first axis;
a tracer probe;
a spring urging said tracer probe along a second axis. Perpendicular to said first axis, in contact with the outer surface of the model last as the model last is rotated by said motor about said first axis;
a second encoder producing an electrical output representing the instantaneous linear position of said tracer probe along said first axis;
linear drive means for driving said tracer probe along a third axis parallel to said first axis;
and a third encoder producing an electrical output representing the instantaneous linear position of the tracer probe along said third axis.

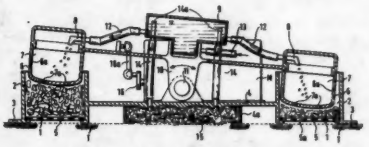
4,884,310

SHAMPOOING APPARATUS FOR CARPETS AND THE LIKE

Leopold Knestele, Biberacherstrasse 14, DE 7967 Bad Waldsee, Fed. Rep. of Germany

Filed Jun. 17, 1988, Ser. No. 208,887
Int. Cl.[4] A47L *11/34*
U.S. Cl. 15—3 **11 Claims**

1. A carpet shampooing apparatus comprising:
a housing displaceable over a carpet to be cleaned and provided with a housing wall facing and in contact with the carpet, said wall being provided with a multiplicity of apertures communicating between a chamber within said housing and the carpet;
a sponge body in said chamber having a large-pore cellular structure compressible and expandable to foam a cleaning liquid applied to said carpet by mixing it with air upon alternating expansion and compression of said body;
sponge-compression means in said housing for subjecting said body cyclically to alternating compression and expansion with a volume change per cycle of substantially 1:4; and



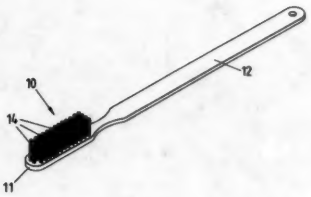
a motor on said housing operatively connected to said sponge-compression means for driving same at a rate corresponding to a frequency of said compression and expansion cycles of about 100 per minute.

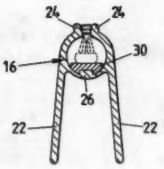
4,884,311

DENTAL APPLIANCE

Harbert S. Gergory, 26 Country Club Park, Covington, La. 70433

Filed May 27, 1988, Ser. No. 199,373
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—167.1 **12 Claims**





7. In a dental appliance comprising an elongated handle portion and a rectangular array of bristles at one end of said handle portion in combination with detachable means for forming said array of bristles into a wedge-like configuration with the free ends of said bristles flaring upwardly and outwardly from the apex of said configuration, such that said bristles retain a wedged and flared configuration upon removal of said detachable means and said flared free ends form a coordinated mass for engaging the sulcus region of the gum.

11. A method for utilizing a toothbrush wherein the toothbrush bristles assume a desired shape which facilitates hygienic manipulation of the sulcus region comprising the steps of:
(a) applying pressure to the bristles in a predetermined region compressing the bristles in said region to form a lower wedge-shaped mass of bristles and an upper wedge-shaped mass of bristles, said wedge-shaped masses being formed in opposition such that the upper wedge-shaped mass is formed with the free ends of the bristles extending

upwardly and outwardly, said free ends defining a flared region adapted for hygienic engagement with the sulcus;

(b) removing the pressure from said toothbrush for normal use in brushing the teeth and the sulcus region of the mouth; and

(c) reapplying pressure along said line during the time when said toothbrush is not in use.

4,884,312

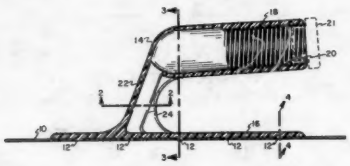
HAND TROWEL

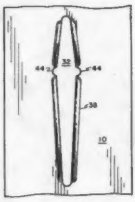
Ronald M. Clark, 105 Factory, Addison, Ill. 60101

Continuation-in-part of Ser. No. 4,592, Jan. 20, 1987, abandoned. This application Oct. 23, 1987, Ser. No. 111,928

Int. Cl.[4] B05C *17/10*; E01C *19/12*; B23P *17/00*

U.S. Cl. 15—235.4 **2 Claims**





1. A hand trowel comprising

a substantially flat blade having an elongate slot disposed therethrough substantially along the longitudinal centerline thereof, said slot being provided with at least one pair of opposed outwardly extending notches disposed at a point intermediate and spaced from the ends of the slot:

a handle formed entirely of a thermoplastic material having a base portion molded to said blade such that said material flows through said slot and sets on both sides of said blade to thereby secure said handle to said blade without substantial deformation of said blade;

said opposed outwardly extending notches operating to divide shrinkage of said thermoplastic material as the same sets into at least two longitudinal components.

2. A method of making a hand trowel comprising the steps of

forming a substantially flat metal blade;

forming an elongate slot through and substantially along the longitudinal centerline of said blade;

bending the edges of said blade adjacent the sides of said elongate slot upwardly to thereby provide a cavity in the underside of said blade;

forming at least one pair of opposed notches in the edges of said elongate slot intermediate the ends thereof;

placing said blade in an injection molding die adapted for forming a handle;

injecting a thermoplastic material into said molding die such that said material passes through said elongate slot and sets on the underside of said blade opposite said handle;

to thereby produce a hand trowel having an entirely thermoplastic handle intergrally formed with said blade.

4,884,313

STREET SWEEPER MACHINE WITH TRASH PICK-UP AND TRANSPORT CAPABILITIES

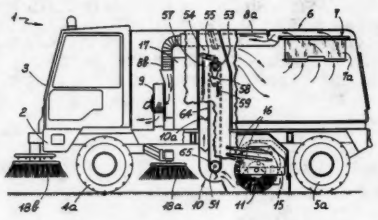
Sergio Zoni, Parma, Italy, assignor to Dulevo S.p.A., Sanguinaro Di Fontanellato, Italy

Filed May 19, 1988, Ser. No. 195,824

Claims priority, application Italy, May 19, 1987, 20586 A/87

Int. Cl.[4] E01H *1/02*

U.S. Cl. 15—340.3 **12 Claims**



1. A street sweeper machine for picking up and transporting trash, comprising: a frame having a main longitudinal dimension and engaging at least front and rear wheels having axes of rotation which converge together in cornering, a driver's cab, motor means, a trash bin, a roll brush having an axis of symmetry substantially parallel to a surface to be swept and transverse to said longitudinal dimension, a trash conveyor adapted to convey trash from said roll brush to said bin, and a steering mechanism engaging all said wheels to make them all steering wheels, and adapted in cornering to dispose said wheels with their axes of rotation convergent on a steering center proximate a continuation of said axis of symmetry of said roll brush.

4,884,314

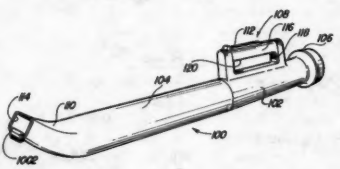
PORTABLE BLOWER

Jonathan L. Miner, Timonium; Vernon R. Lacher, Fallston; Gerald J. Rescigno, Baltimore, all of Md.; William B. Swim, Cookeville, Tenn.; Martin P. Gierke, and David A. Hahn, both of Baltimore, Md., assignors to Black & Decker Inc., Newark, Del.

Filed Nov. 12, 1987, Ser. No. 119,491

Int. Cl.[4] A47L *5/14*

U.S. Cl. 15—344 **79 Claims**



1. Portable blower apparatus comprising:

an elongate tubular housing having an inlet end and an outlet end;

a drive motor having a drive shaft extending substantially coaxially with the longitudinal axis of the housing;

fan means coupled to the drive shaft for rotation about said longitudinal axis for moving air from the housing inlet end to the housing outlet end; and

airflow directing and smoothing means positioned with respect to the drive motor and fan means to smooth the

airflow passing over the drive motor and to maintain the airflow substantially parallel to said longitudinal axis;

the fans means being positioned relative to the housing inlet such that standing waves within the housing having predominant noise frequencies generated by the fan means are inhibited.

4,884,315

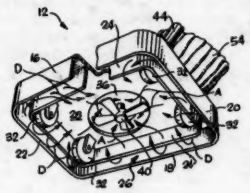
VACUUM CLEANER HAVING CIRCUITOUS FLOW

Richard E. Ehnert, 690 Persian Dr., Sunnyvale, Calif. 94087

Filed Dec. 10, 1987, Ser. No. 131,180

Int. Cl.[4] A47L 5/14

U.S. Cl. 15—346 **16 Claims**



1. A closed circuit vacuum cleaning apparatus comprising,

a nozzle housing having a cover portion and a wall portion downwardly depending from said cover portion, said wall portion having an interior surface and having a leading and a trailing end and opposed sides to form an enclosure having an open bottom,

a downwardly extending baffle spaced apart from said internal surface of the wall portion along said leading and trailing end and said sides to define an air-recirculation duct therebetween, said baffle further defining an evacuation chamber surrounded by said air-recirculation duct,

an evacuation port in said nozzle housing in fluid communication with said evacuation chamber,

an exhaust port in said nozzle housing in fluid communication with said air-recirculation duct,

conduit means for providing an imperforate fluid connection of said evacuation port with said exhaust port external of said nozzle housing, said conduit means including a filtration means for air filtration and particle collection, and

vacuum means operatively associated with said conduit means for pressurizing air from said evacuation chamber to said air-recirculation duct via said filtration means.

4,884,316

HINGE

Yoshinori Masuda, Tokyo, Japan, assignor to Kabushiki Kaisha Murakoshi Seiko, Tokyo, Japan

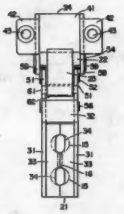
Filed Dec. 7, 1988, Ser. No. 280,883

Claims priority, application Japan, Jun. 10, 1988, 63-76875[U]

Int. Cl.[4] E05F 1/14

U.S. Cl. 16—288 **5 Claims**

4. A hinge (13) according to claim 1 wherein said inwardly bent screw support plate portions (33) are provided with a plurality of screw insertion holes (34) therethrough, each of



which holes (34) extends through said screw support plate portions (33) and through said joint.

4,884,317

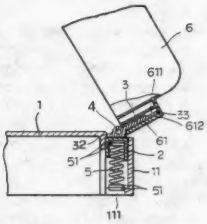
HINGE UNITS FOR JOINING A CASE AND ITS LID

Ping-Hsiung Liu, No. 15, Lane 107, Fu Kang St., Taipei, Taiwan

Filed Feb. 7, 1989, Ser. No. 307,049

Int. Cl.[4] E05F 1/12

U.S. Cl. 16—289 **2 Claims**



1. Improved hinge units for joining a case and a lid, each unit comprising:

a pair of bend units integrally connected to a side wall of said case in spaced apart relation, each of said bend units having tunnel-shaped passages extending horizontally and aligned one with respect to the other;

a receptacle body including a bottom wall and a circumferential wall extending upwardly from the periphery of said bottom wall, said receptacle body being integrally connected to said side wall of the case and positionally located between and slightly below the bend units;

a spring disposed within said receptacle body;

a guide member having a top plate with a flat top surface and at least a pair of opposing side plates, said guide member being slidably received within said receptacle body and supported by said spring;

a joint plate having a through opening formed in a lower portion of said joint plate, said through opening extending transversely through said lower portion of said joint plate, said lower portion of said joint plate including a bottom slope member having a plurality of surfaces, whereby a different one of said surfaces is in contiguous contact with said flat top surface of said guide member top plate responsive to positioning of said lid relative to said case for stably maintaining said lid position, said joint plate having an upper portion wherein there is formed a resilient lock member;

a pin extending through said through opening formed in said lower portion of said joint plate and having opposing ends engaged in said tunnel-shaped passages of the bend units; and

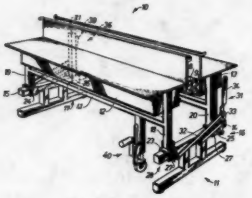
a socket member integrally connected to a side wall of said lid, said socket member having a cavity adapted to receive said upper portion of said joint plate and provide locking engagement with said resilient lock member.

4,884,318

HINGED POULTRY DEFEATHERING APPARATUS

Jacobus E. Hazenbroek, Burg. de Zeeuwstraat 52, Numansdorp, Netherlands

Filed Jan. 23, 1989, Ser. No. 299,259
Int. Cl.[4] A22C 21/02
U.S. Cl. 17—11.1 R 18 Claims



1. Apparatus for picking feathers from suspended poultry carcasses moving in succession along a predetermined path of travel comprising:

a support frame for positioning along the path of travel of the poultry carcasses;

first and second banks of flexible feather picking fingers mounted to said support frame for positioning on opposite sides of the path of travel of the poultry carcasses;

first support means for releasibly supporting a first end of said first bank upon said support frame; and

second support means for pivotably supporting a second end of said bank opposite said first end upon said support frame for movement of said first bank about a vertical axis;

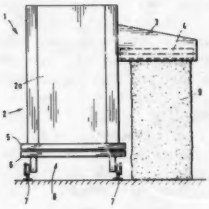
whereby the first bank can be pivoted toward and away from the second bank to allow the pickers to be cleaned or replaced.

4,884,319

APPARATUS FOR ARRESTING THE ROTARY TOWER OF A BALE OPENING DEVICE

Reinhard Schmidt, Gescher, Fed. Rep. of Germany, assignor to Hergeth Hollingsworth, GmbH, Duelman, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,808
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734484; Sep. 20, 1988, 3831824
Int. Cl.[4] D01G 7/00
U.S. Cl. 19—80 R 17 Claims



1. In a bale opening device for opening fiber bales and the like, said device having a rotary tower supported for pivotal movement about 180 degrees, which reciprocates on a carriage along a row of bales and is at least one cantilevered arm carried by said tower, and reducing means carried by said cantilevered arm for reducing said bales as said tower reciprocates along said row, stops for limiting the rotational movement of the tower, and a motor for causing the pivotal movement of the tower about 180 degrees wherein the improvement comprises:

a rotary part which pivots with said tower;

a nonpivoting base carried by said carriage;

a stop bar carried by said rotary part;

a plurality of stop brackets carried by said base cooperating with said stop bar;

electrical driving means for causing said pivotal movement; and

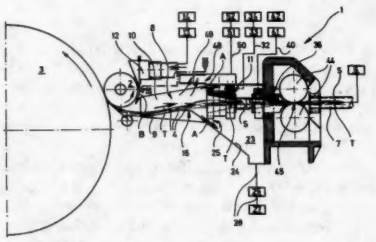
stopping means for stopping the pivotal movement of said tower by braking said tower against pivotal movement with a brake when said stop bar of said rotary part abuts one of said stop brackets while the torque of said driving means is maintained.

4,884,320

APPARATUS FOR GATHERING A TEXTILE FIBRE FLEECE AND FORMING A FIBRE SLIVER

Hermann Gasser, Frauenfeld; Karl Curiger, Pfäffikon, and Hans Rutz, Winterthur, all of Switzerland, assignors to Hollingsworth GmbH, Neubulach, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,082
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722771
Int. Cl.[4] D01G 15/64
U.S. Cl. 19—106 R 20 Claims



1. Apparatus for gathering a textile fibre fleece from a doffer (3) of a card and forming therefrom a fibre sliver which is then fed to a conveyor (7) for storage or further processing, said apparatus comprising a trough (8) extending from a take-off location defined by a take-off roller (2), said trough (8) having a width substantially corresponding to that of said take-off location and having a bottom (9) and sidewalls (10) converging in the shape of a funnel, and a funnel disposed at one end (19) of said trough (8), wherein said funnel is formed as a compressed-air-operable injector (11) for conveying and forming the sliver (5), and wherein said end (19) of said trough (8) is connected to exhaustor means (23) for sucking the fibre fleece (4) towards said injector (11).

4,884,321

SHOE LACE GRIP

Elvin G. Holub, 5 Robby Rd., Shawnee, Okla. 74801

Filed Jul. 25, 1988, Ser. No. 223,510
Int. Cl.[4] A43C 7/00
U.S. Cl. 24—712.6 2 Claims

1. A grip for the loose end portions of a strand, comprising:

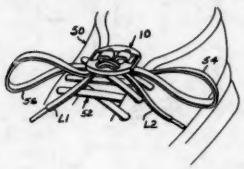
an elongated body having top and bottom surfaces and having opposing ends,

said body having a longitudinal slot open through its top and bottom surfaces medially its ends defined by opposing vertical side walls and end walls converging downward

from the upper limit of the respective ends of the body and inwardly of said opposing body ends; and,

means including a pair of spaced-apart bridging the central portion of the slot adjacent said top surface, for defining a pair of strand end portion tortuous paths at respective end portions of the body,

said strand end portion tortuous paths extend inward from the ends of the body beneath its bottom surface, upwardly through the body centrally the length of the slot, transversely over the respective bar toward the respective said body end, downwardly adjacent the converging wall surfaces defining the end limits of the slot and longitudinally beyond the respective end of the body in doubled-back-upon-itself sliding friction relationship,



said body being longitudinally arcuately bowed upward and further characterized by a pair of vertical apertures laterally of the slot for slidably receiving in superposed relation the strand end portions extending beyond said body ends,

each bar of said pair of bars having roughened friction inducing surfaces in the area contacted by the end portions of a pair of strands when entrained therearound,

whereby the intersection of the downwardly converging end walls with the body bottom surface form spaced-apart pinch points on a strand end portion when superposed under longitudinal tension thereunder.

4,884,322

COUPLING DEVICE

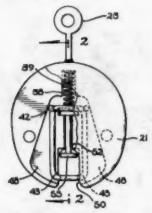
Hope Jaquith, P.O. Box 6804, Laguna Niguel, Calif. 92677; Kent Jaquith, Rte. 1, Box 1401, Zillah, Wash. 98953, and William Jaquith, P.O. Box 6804, Laguna Niguel, Calif. 92677

Filed Mar. 30, 1982, Ser. No. 363,612

The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.

Int. Cl.[4] A44B *13/02*

U.S. Cl. 24—241 PS **2 Claims**



1. A coupling device comprising a body portion having a cutout with a predetermined width defined on one end thereof, two retractable jaws, each of said jaws normally extending into said cutout from opposite sides thereof, a spring disposed within said body portion adapted to urge said jaws to extend into said cutout, a plunger disposed within said body portion adapted to compress said spring and urge said jaws to a retracted position when a predetermined pressure is applied to said plunger in a direction opposite said cutout, said plunger having an end which extends into said cutout, which end has a predetermined extent, said extent being of substantially the same width as the width of said cutout, thereby having a sufficient dimension to enable a member with a ring, eyelet, hook or bar disposed within said cutout to maintain said predetermined pressure against said end to maintain said jaws in said retracted position until said member can be disengaged from said coupling device;

whereby said member with a ring, eyelet, hook or bar may be removably coupled to said coupling device by the action of said jaws, said predetermined pressure applied by said member to said plunger at said end of predetermined extent which extends into said cutout, and said spring.

4,884,323

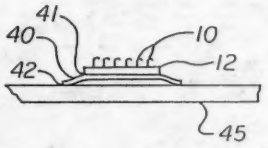
QUIET TOUCH FASTENER ATTACHMENT SYSTEM

George A. Provost, and Rita T. Bakro, both of Manchester, N.H., assignors to Velcro Industries B. V., Amsterdam, Netherlands

Filed Jan. 14, 1988, Ser. No. 143,979

Int. Cl.[4] A44B *18/00*

U.S. Cl. 24—442 **21 Claims**



1. A touch fastener mounting system comprising a touch fastener component having a planar backing member carrying engaging elements extending from one surface thereof, said backing member being attached by way of attachment means to a first member; said elements of said touch fastener component being capable of engaging elements of a mating fastener component, carried by a second member, to releasably fasten said first member to said second member; the attachment means including means for isolating said first member from noise producing energy generated by said backing member upon separation of said mating fastener components.

4,884,324

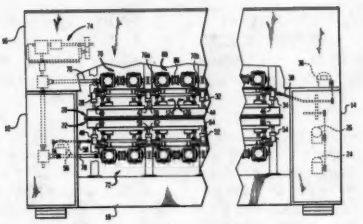
NEEDLE LOOM HAVING IMPROVED NEEDLE BEAM GUIDE SYSTEM

Peter P. Stanislaw, Bennington, Vt., assignor to Morrison Berkshire, Inc., North Adams, Mass.

Filed Oct. 12, 1988, Ser. No. 256,488

Int. Cl.[4] B22B *5/06*; D04H *1/46*

U.S. Cl. 28—107 **7 Claims**



1. A needle loom, comprising a frame; a needle beam; means, including a drive shaft and a crank means carried by said drive

shaft and coupled to said needle beam, for reciprocating said needle beam relative to said frame; and, means, including a guide means fixedly carried by one of said frame and said needle beam and a slide means pivotally carried by the other of said frame and said needle beam and slidable relative to said guide means, for guiding said needle beam during reciprocating movement of the latter relative to said frame.

4,884,325

PROCESS FOR THE MANUFACTURE OF A BLANKET PRODUCT

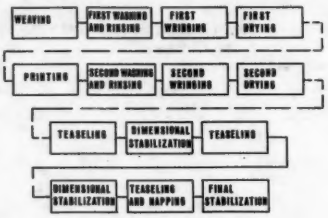
Gaetano Marzotto, Cornedo, Italy, assignor to Manifattura Lane Gaetano Marzotto & Figli S.P.A., Vicenza, Italy

Filed Oct. 29, 1987, Ser. No. 114,672

Claims priority, application Italy, Oct. 31, 1986, 22209 A/86; Dec. 30, 1986, 22893 A/86

Int. Cl.[4] D06C *11/00, 27/00*

U.S. Cl. 28—160 **6 Claims**



1. A process for the manufacture of a blanket product comprising the following steps:

weaving of an upper fabric having weft and warp yarns with a lower fabric having weft and warp yarns such that at least some of the warp yarns of one of the fabrics are interlaced with the weft yarns of the other fabric to produce a woven product, said lower fabric weft yarns being wool;

washing of the product;

drying of the product;

after washing the product, at least one step of teaseling the wool yarns of the lower fabric and dimensional stabilization of the teaseled product; said dimensional stabilization being a combined action of moistening, heating and tensioning the product in the direction of the longitudinal extension of the teaseled yarns, said tensioning still lasting at the end of the heating and moistening operations; and a final step of teaseling the wool yarns of the lower fabric, napping the teaseled yarns, and dimensional stabilization of the napped yarns whereby in said final step the teaseling raises the wool fibers which may have been compressed during stabilization and the napping imparts a loop conformation to the raised fibers.

4,884,326

METHOD AND APPARATUS FOR HYDRAULIC TURBINE ROTATION FOR REPAIR

Benny R. Porter, Chattanooga, Tenn., and Doyle G. Bowers, Humble, Tex., assignors to Arc Plan, Inc., Chattanooga, Tenn.

Filed Mar. 20, 1989, Ser. No. 325,762

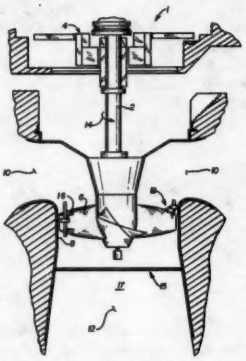
Int. Cl.[4] B21K *3/00*

U.S. Cl. 29—156.8 R **18 Claims**

1. A method for use in a hydroelectric turbine structure comprising a turbine shaft, a generator rotor assembly coupled to an upper portion of said turbine shaft, a turbine blade assembly coupled to a lower portion of said turbine shaft and comprising a plurality of turbine blades extending radially from said turbine shaft, and a turbine chamber having a cylindrical configuration and formed by a vertically disposed turbine liner wall adjacent distal ends of said turbine blades, said method adapted for repair of pitting and general deterioration of surfaces of said liner wall and said turbine blades, and comprising the steps of:

removing water from said turbine chamber;

mounting a repair assembly at or substantially adjacent a distal end of at least one of said turbine blades, said repair assembly comprising conditioning devices for repairing surface deterioration of said liner wall;



mounting a turning apparatus at or substantially adjacent a distal end of at least one of said plurality of turbine blades;

rotating said plurality of turbine blades and said turbine shaft by exerting forces directly between said turning apparatus and said liner wall, thereby causing said conditioning devices to traverse said liner wall; and

repairing deterioration of said liner wall by use of said conditioning devices during said traversal of said liner wall.

4,884,327

BOOT ASSEMBLING APPARATUS FOR DRIVE SHAFT

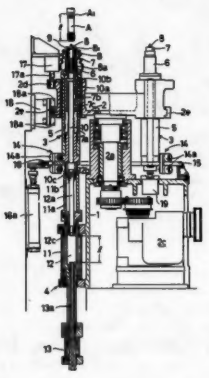
Nobuyoshi Nagatsuma, and Yoshiharu Kamata, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 323,712

Claims priority, application Japan, Mar. 18, 1988, 63-65539

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—235 **3 Claims**



1. A boot assembling apparatus for assembling a boot to a

driving shaft, said boot provided at its leading end with a bead adapted to fit over the shaft, comprising:

an assembling jig positioned to be axially aligned with the driving shaft and having a jig body movable toward and away from the driving shaft in an axial direction of the driving shaft;

a seat mounted on a leading end of said jig body for receiving an inner end face of the bead of the boot;

a guide sleeve mounted in the jig body and projectable forwardly of said seat, said guide sleeve being normally retained forcibly in a state in which it remains projecting forwardly of the seat for a predetermined length approximately equal to a length of the bead, said guide sleeve being shaped to be fitted over the driving shaft and into the bead of the boot;

a guide shaft mounted in said guide sleeve and slidable axially rearwardly relative to said guide sleeve, said guide shaft being shaped to abut against and center an end face of the driving shaft for centering the driving shaft;

a push rod inserted in said jig body for urging said guide shaft axially forwardly, and provided with a restricting portion for restricting a axially forward sliding stroke of said guide sleeve to a predetermined extent;

a first cylinder for urging said jig body axially forwardly; and

a second cylinder mounted on a piston rod of said first cylinder, so that said push rod is reciprocated by the operation of said second cylinder.

4,884,328

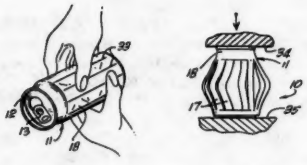
PROCESS FOR MAKING DECORATIVE ITEM FROM ALUMINUM CANS

Charles M. Neighbors, 14141 Light St., Whittier, Calif. 90604

Filed Feb. 9, 1989, Ser. No. 308,021

Int. Cl.[4] B21K *21/16*; B23P *17/04, 23/00*

U.S. Cl. 29—401.1 **4 Claims**



1. A process for making a decorative item from an aluminum can having a cylindrical side wall and can ends said process comprising the steps of:

scribing a plurality of parallel grooves in a generally longitudinal direction in said cylindrical side wall to form a scribed side wall;

pressing inwardly repeatedly on the scribed side wall until the side wall breaks at the scribed grooves to form a plurality of longitudinal slats; and

bending the longitudinal slats outwardly by applying axial force to said can ends to form a decorative item.

4,884,329

PRECISION AUTOMATIC ASSEMBLY APPARATUS, WITH ELECTROMAGNETICALLY SUPPORTED MEMBER AND ASSEMBLY METHOD USING SAME

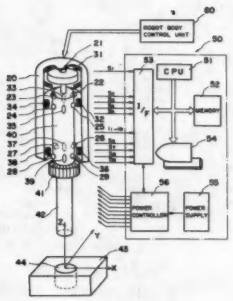
Toshiro Higuchi, Yokohama, Japan, assignor to Research Development Corporation, Tokyo, Japan

Filed Apr. 13, 1987, Ser. No. 37,919

Claims priority, application Japan, Feb. 20, 1987, 62-35901; Feb. 20, 1987, 62-35902

Int. Cl.[4] B25J *11/00*

U.S. Cl. 29—407 **5 Claims**



1. A precision automatic assembly apparatus for inserting an insertable part into a hole formed in a member, comprising:

(a) a movable hand;

(b) a movable body incorporated in said hand;

(c) an electromagnetic-type wrist mechanism having a plurality of electromagnetic devices for supporting said movable body and controlling said movable body along a plurality of axis;

(d) a position detector for detecting the position of said movable body;

(e) said insertable part being mounted on an end portion of said movable body;

(f) means for determining the external force which acts upon said insertable part in a position at which said insertable part contacts said member based on an output signal from said position detector inputted to said determining means and current values of excitation coils of said electromagnetic device inputted to said determining means and for determining the absence of said external force when said insertable part is aligned with and inserted into said hole; and

(g) means for adjusting the position of said insertable part relative to said hole based on an output signal from said external force determining means until said insertable part and said hole are in alignment and said part is inserted in said hole.

4,884,330

ASSEMBLY METHOD

Walter Sticht, Attnang-Puchheim, Austria, assignor to STIWA-Fertigungstechnik Sticht GesmbH, Attnang-Puchheim, Austria

Division of Ser. No. 885,332, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 592,368, Mar. 22, 1984, abandoned. This application Oct. 13, 1987, Ser. No. 109,937

Claims priority, application Austria, Apr. 21, 1983, 1433/83

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—430 **1 Claim**

1. A method of assembling a plurality of individual parts to manufacture a workpiece, which comprises the steps of

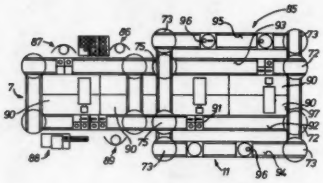
(a) placing each single one of the individual parts in a respective holder in a preparation stage, the holder holding each

single individual part in a predetermined position, and mounting a plurality of said holders on a transport carrier,

(1) at least two of said holders on the transport carrier holding single individual parts of the same type whereby one of the two holders serves as a reserve holder for said individual part of the same type if one of the individual parts of the same type is defective,

(b) conveying assembly support along a conveying path to sequentially arranged work stations whereat the respective single individual parts are assembled on the assembly support,

(c) conveying the transport carrier from the preparation stage to respective ones of said work stations along said conveying path for alignment of respective ones of said



holders with the assembly support at the respective work stations,

(d) removing respective ones of said single individual parts from the respective holders at the respective work stations and placing said removed parts on the assembly support for assembly thereon,

(1) the assembly support and the transport carrier being conveyed along said conveying path from one of the work stations to a subsequent one of the work stations,

(e) returning the transport carrier to the preparation stage after the single individual parts held in the respective holders have been removed, and

(f) again placing a respective single one of the individual parts in a respective holder in the preparation stage in a predetermined position.

4,884,331

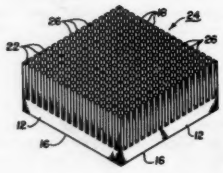
METHOD OF MANUFACTURING HEAT SINK APPARATUS

Howard G. Hinshaw, Dallas, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.

Continuation of Ser. No. 42,706, Apr. 27, 1987, abandoned. This application Oct. 26, 1988, Ser. No. 262,695

Int. Cl.[4] B23P *13/04*

U.S. Cl. 29—558 **4 Claims**



1. The method of forming a unitary heat sink metal body for use in removal of heat from a heat generating electronic device package comprising the step of gang sawing a first predetermined number of parallel grooves having a first predetermined width and a first predetermined depth into a first surface of a metal body of heat conducting material along a first dimension thereof to form a predetermined number of parallel fins of a predetermined height and width, whereby the ratio of the height of said parallel fins to the width of said parallel grooves is at least six to one and the width of said fins is no greater than the width of said grooves.

4,884,332

TOOL CHANGER

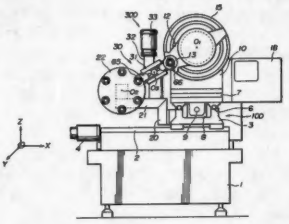
Akira Ozawa; Tomomi Kousaka, both of Saitama; Hideo Suzuki, and Masatoshi Murakami, both of Shizuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1988, Ser. No. 193,072

Claims priority, application Japan, May 12, 1987, 62-71507[U]

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **5 Claims**



1. A tool changer in a machine tool having a spindle device for holding and rotating a tool about a spindle shaft and a tool magazine for storing a plurality of tools to be mounted, one at a time, on the spindle device, said spindle device being movably supported around a first axis generally parallel to said spindle shaft, and said tool magazine being rotatably supported about a second axis generally parallel to said first axis, said tool changer comprising:

a tool arm disposed between said spindle device and said tool magazine, said tool arm being angularly movable about a third axis generally parallel to said first and second axes on a plane including said first and second axes, and movable along said third axis;

a pair of chucking units mounted respectively on ends of said tool arm and movable in mutually opposite directions passing through said third axis for simultaneously gripping tools, respectively; and

a mechanism for actuating said tool arm and said chucking units.

4,884,333

METHOD OF MAKING A STEPPER MOTOR

Roy Cooper, Waterbury, and Charles Hansen, Wolcott, both of Conn., assignors to Tri-tech, Inc., Waterbury, Conn.

Division of Ser. No. 121,170, Dec. 30, 1987, Pat. No. 4,841,189. This application Feb. 21, 1989, Ser. No. 312,765

Int. Cl.[4] H02K *15/02*

U.S. Cl. 29—596 **4 Claims**

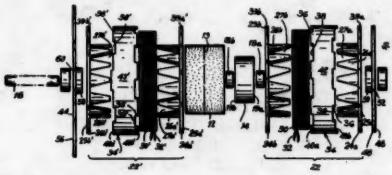
1. In a method of making an electric rotating machine having an annular permanent magnet rotor with rotor poles of alternating polarity around its circumference, the steps of:

assembling two stator phase assemblies each including a pair of pole pieces of annular configuration in opposed relationship with each other to form an annular space therebetween, each said pole piece including along its inner periphery spaced-apart salient stator poles, with the stator poles of the pole pieces of each stator phase assembly being interleaved with one another;

orienting the stator phase assemblies such that the stator poles on the pole pieces of one of the assemblies have a 90 electrical degree index spacing from the stator poles on the pole pieces of the other assembly;

permanently affixing a first pole piece of one of said stator phase assemblies to a second pole piece of the other stator phase assembly with the stator poles oriented to provide said index spacing, each of said first and second pole pieces having a plurality of spaced tabs around its periphery, the orientation of the stator phase assemblies positioning the tabs on said first pole piece in overlapping facing contact with the tabs on said second pole piece;

forming a flat blank of magnetic material with side edges each including a plurality of grooves and protrusions and



with equally spaced longitudinal grooves intermediate said side edges;

bending said flat blank around the affixed first and second pole pieces with the overlapping tabs extending into said longitudinal grooves to form a field ring for said stator phase assemblies, the field ring comprising a portion of a multi-part housing for said machine; and

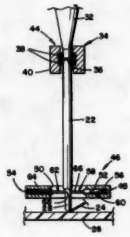
positioning a pair of energizing windings in respective cooperating relationship with said stator phase assemblies to enable the formation of magnetic fields in different phase relationship with each other.

4,884,334

RESONANT STYLUS SUPPORT

David E. Houser, Appalachin, and Richard J. Morenus, Endwell, both of N.Y., assignors to International Business Machines, Corp., Endicott, N.Y.

Filed Feb. 5, 1986, Ser. No. 826,203
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—739 **13 Claims**



1. In a wire embedder machine including an elongated stylus terminating at a tip member adapted to engage and apply to an adhesive coated substrate a wire in the course of producing an encapsulated circuit board, drive means for vibrating said stylus at a constant ultrasonic frequency along a longitudinal axis, and a support holding said stylus fixed at a nodal point thereof distant from said tip member, the improvement comprising:

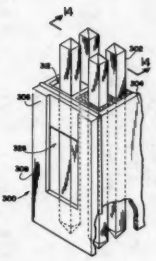
flexure means mounted on said machine engageable with said stylus at said tip member to restrain said stylus against lateral movement while freely permitting longitudinal movement thereof as said stylus moves along its longitudinal axis, said flexure means having a natural frequency substantially the same as said stylus so as to resonate in concert therewith.

4,884,335

SURFACE MOUNT COMPATIBLE CONNECTOR SYSTEM WITH SOLDER STRIP AND MOUNTING CONNECTOR TO PCB

Michael J. McCoy, Lyndhurst; John E. Hartman, and John L. Wesbster, both of Painesville, all of Ohio, assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 12,191, Feb. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 747,343, Jun. 21, 1985, Pat. No. 4,641,426, and Ser. No. 782,351, Oct. 1, 1985, Pat. No. 4,663,815. This application Jun. 29, 1988, Ser. No. 217,130
Int. Cl.[4] H05K *3/34*
U.S. Cl. 29—839 **31 Claims**



1. A method of manufacturing an electrical component including an electrically non-conducting body, plural generally elongate contacts extending from the body for insertion into plated through holes in a printed circuit board, and the component having at least one substantially continuous solder strip extending between and at least partly surrounding at least part of a plurality of such contacts, for melting, for flow into respective plated through holes, and for re-solidifying mechanically and electrically to couple the component to such printed circuit board, said method comprising the steps of placing such strip of solder type material simultaneously on a plurality of such contacts and pushing such strip of solder type material simultaneously along a plurality of such respective contacts and into relatively close proximity of such body.

4,884,336

METHOD AND APPARATUS FOR MOUNTING ELECTRICAL CONNECTORS TO PRINTED CIRCUIT BOARDS

Mark H. Waters, Harrisburg, and Robert N. Whiteman, Jr., Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 22, 1987, Ser. No. 99,567
Int. Cl.[4] H01R *9/16*; B23P *19/00*
U.S. Cl. 29—845 **21 Claims**

1. A method for mounting an electrical connector to a support panel, comprising:

providing an electrical connector having aperture means therein, said aperture means defining wall means;

providing a tool having a radially expandable portion thereon, said radially expandable portion having barbs thereon;

inserting said radially expandable portion of said tool into said aperture means;

operating said tool to radially expand said radially expandable portion thereof until the barbs thereon engage said wall means; and

positioning said connector relative to a support panel,

whereby said aperture means align with an aperture in the support panel.

12. An actuation tool for mounting an electrical connector to support panel with a top-actuated eyelet having a bore therein defined by a sidewall, said tool comprising an actuation member including:

a tool holder;

a collet supported in said tool holder, said collet having an expandable front portion extending forwardly of said holder having barbs thereon, said collet having an axial passageway having an internal tapered surface portion thereon;

an actuating plunger extending through said collet passageway and being axially movable with said collet passageway, said plunger having a front portion extending forwardly of said collet and an external tapered surface portion within said collet; and

means for operating said actuating plunger from a retracted position during which said front portions of said collet and said plunger are inserted into said top-actuated eyelet, to a first, partially extended position during which said external tapered surface portion on said plunger engages said internal tapered surface portion on said collet passageway to urge said expandable front portion of said collet into gripping engagement with the sidewall of the eyelet, to a second, fully extended position during which said front portion of said plunger actuates said eyelet to attach the connector to a support panel.

4,884,337

METHOD FOR TEMPORARILY SEALING HOLES IN PRINTED CIRCUIT BOARDS UTILIZING A THERMODEFORMABLE MATERIAL

Edward J. Choinski, Wayland, Mass., assignor to Epicor Technology, Inc., Wayland, Mass.

Division of Ser. No. 935,256, Nov. 26, 1986, Pat. No. 4,748,742. This application Oct. 15, 1987, Ser. No. 109,266

The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.

Int. Cl.[4] H05K *3/02*

U.S. Cl. 29—846 **102 Claims**

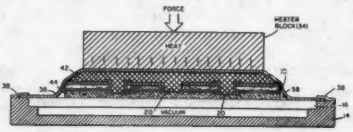
1. A method for temporarily sealing holes in a printed circuit board during processing of the printed circuit board, said method comprising the steps of:

A. placing a sheet of deformable material on one side of a printed circuit board having holes therein;

B. deforming said sheet material so that the material extends into each hole to form a protectively sealing plug therein;

C. coating the other side of the printed circuit board with a process fluid;

D. processing the printed circuit board; and, thereafter,



E. detaching the deformed sheet material from the printed circuit board.

4,884,338

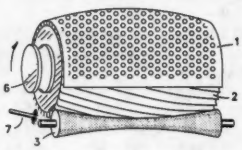
ELECTRIC SHAVER IMPROVEMENT

John V. Stewart, 1308 Henry Balch Dr., Orlando, Fla. 32810

Filed Jul. 18, 1988, Ser. No. 220,159

Int. Cl.[4] B26B *19/16*

U.S. Cl. 30—43.92 **11 Claims**



1. A hair shaving device, comprising:

a cutter assembly having a rotatable drum, a plurality of elongated flat blades, fixed helically in and extending radially from said rotatable drum,

a thin, semi-flexible screen perforated with a matrix of apertures, part of said screen in contact with, and conforming to, part of the rotation surface of said cutter assembly,

power means for rotating said cutter assembly about its axis; and

a case, at one end of which is mounted said cutter and said screen,

and within which is mounted said power means.

4,884,339

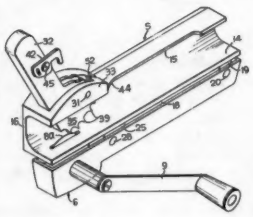
SHIELDED CABLE CUTTER WITH IMPROVED CABLE CLAMP

James R. Custin, Elm Grove, Wis., assignor to GB Electrical, Inc., Milwaukee, Wis.

Filed Sep. 12, 1988, Ser. No. 243,516

Int. Cl.[4] B21F *13/00*

U.S. Cl. 30—90.4 **7 Claims**



1. A device for cutting through the shielding of a shielded cable, comprising a saw blade contained in a plane and having

a cutting edge portion; a saw carrier on which the saw blade is confined to edgewise motion; an elongated cable carrier of U-shaped cross-section defining an elongated groove extending along the length of the cable carrier and into which a shielded cable is laterally insertable, said cable carrier having an elongated transverse wall connecting a pair of elongated side walls that have inner surfaces facing one another across said groove; means providing a connection between said carriers that disposes them with said plane parallel to the length of the cable carrier and substantially normal to said inner surfaces and confines the carriers to motion towards and from one another transversely to the length of the cable carrier and parallel to said plane whereby said cutting edge portion of the saw blade is carried into and out of said groove through a lengthwise extending slit in one of said side walls; and cable clamping means for readily releasably confining shielded cable in said groove for cutting by the saw blade, comprising trunnion means on the cable carrier defining a clamping axis, a clamping member confined to rotation on said trunnion means and having cable engaging surface portions which are disposed along a segment of a spiral about said axis to be at increasing distances from said axis so that rotation of the clamping member about said axis brings successive surface portions progressively nearer said one side wall for clamping a shielded cable against its inner surface, and an actuating lever secured to said clamping member and extending substantially radially to said axis whereby the clamping member can be manually rotated about said axis, said cable clamping means of said device being characterized by:

A. said trunnion means being so mounted on the cable carrier that said clamping member axis
   (1) is opposite said slit in said one side wall,
   (2) is spaced outwardly from the inner surface of the other side wall, and
   (3) extends normal to said plane; and

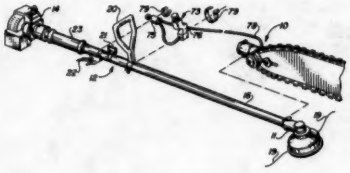
B. said cable engaging surface portions on said clamping member being configured
   (1) to be in symmetrical relation to said plane and
   (2) for straddling engagement with a cable in said groove.

4,884,340

CHAIN SAW ATTACHMENT FOR LAWN TRIMMER

Paul K. Newman, 1914 S. Suncoast Blvd., Homosassa, Fla. 32646

Filed Feb. 2, 1989, Ser. No. 305,952
Int. Cl.[4] A01D *35/26, 50/00*
U.S. Cl. 30—122 **20 Claims**



1. An attachment for converting a conventional hand-held portable apparatus for cutting and trimming vegetation into a chain saw, said apparatus comprising:
an elongated tubular frame member;
a motor carried at an end of said frame member;
a drive shaft connected to said motor;
a cutting tool removably secured to an end of said frame member; and
means operatively connecting said cutting tool removably to said drive shaft to be driven by said motor;
and said attachment comprising:
an elongated, planar chain bar having a peripheral groove for receiving and guiding a saw chain therearound;
an adapter housing having an input end dimensioned and configured for removably securing said housing to said frame member in place of said cutting tool, and an output end;
means mounting said chain bar adjacent said output end of said housing;
a chain drive sprocket;
means rotatably mounting said sprocket at said output end of said adapter housing adjacent said chain bar for operative connection removably to said drive shaft for driving said saw chain around said bar by said motor under guidance of said groove;
an oil reservoir;
conduit means for delivering oil from said reservoir to said chain bar for lubricating said chain as said chain is driven around said bar; and
means for releasably securing said oil reservoir and said conduit means to said apparatus.

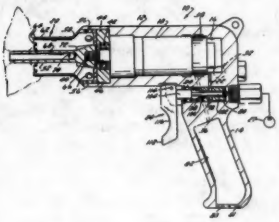
12. A method for converting a conventional hand-held portable apparatus for cutting and trimming vegetation into a chain saw, said apparatus comprising:
an elongated tubular frame member;
a motor carried at an end of said frame member;
a drive shaft connected to said motor;
a cutting tool secured to an end of said frame member; and
means operatively connecting said cutting tool to said drive shaft to be driven by said motor;
said method comprising the steps of:
removing said cutting tool from said frame member and from said operative connection to said drive shaft;
securing to said frame member, in place of said cutting tool, an attachment including an elongated planar chain bar having a peripheral groove for receiving and guiding a saw chain therearound, and further including a chain drive sprocket rotatably mounted adjacent to said chain bar; said sprocket being brought into operative connection to said drive shaft for driving said saw chain around said bar by said motor under guidance of said groove; and
securing to said frame member an oil reservoir and conduit means for delivering oil from said reservoir to said chain bar for lubricating said chain as said chain is driven around said bar.

4,884,341

VENT CUTTER

Lee A. Baertlien, 1571 Granville Rd., Cedarburg, Wis. 53012

Filed Nov. 17, 1987, Ser. No. 121,601
Int. Cl.[4] B25F *3/00*
U.S. Cl. 30—123.3 **10 Claims**



1. A vent cutter comprising
a housing,
an air motor mounted in said housing,
a cylindrical cutter blade assembly having a circular cutting edge and a pilot pin axially aligned in said cutter blade assembly and projecting outward therefrom to guide said cutter blade assembly in operation, said cutter blade assembly being operatively connected to said air motor,
first passage means in said housing for directing water into said cutter blade assembly,

second passage means in said housing for drawing water and waste material out of said cutter blade assembly,

a trigger operated valve assembly mounted in said housing for directing air under pressure into said motor to rotate said cutter blade assembly, and

valve means mounted in said housing for opening said first and second passage in response to an increase in air pressure in said air motor whereby said cutter blade assembly will be cleaned, while operating, by the flow of water through said first passage into the cutter blade assembly and the discharge of water and waste material through said second passage.

4,884,342

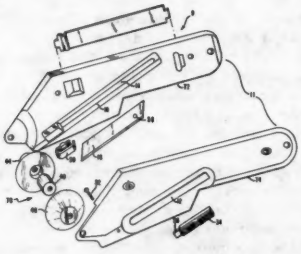
UTILITY KNIFE

William J. McNamara, Flemington, and Stephen Keane, Scotch Plains, both of N.J., assignors to William J. McNamara, Scotch Plains, N.J.

Filed Jun. 8, 1988, Ser. No. 204,104

Int. Cl.[4] B26B *5/00*

U.S. Cl. 30—162 **15 Claims**



1. A retractable, guided utility knife comprising:

a. an elongated handle having a front end, back end, top edge and bottom edge, comprising a first half-handle sidewall secured to a second half-handle sidewall, at least one of said sidewalls having a lengthwise internal passageway and at least one of said sidewalls having a lengthwise external opening, said opening at least partially coextensive with said passageway;

b. an elongated retractable blade slidably mounted between said sidewalls and extendable from said front end;

c. a protruding member slidably mounted within said passageway and removably fixed to said blade;

d. biasing means positioned against said blade for holding said blade against said protruding member;

e. releasing means for moving said blade laterally against said biasing means, away from said protruding member, to release said blade from said protruding member;

f. adjustment means slidably mounted within said opening, removably fixed to said blade, for moving said blade along said passageway; and

g. roller means positioned at said front end, between said sidewalls, for guiding said blade along a cutting path.

4,884,343

SKI BASE FLATTENER

Mark S. Sewell, 4611 Quail Hollow Ct., Fair Oaks, Calif. 95628

Filed Sep. 13, 1988, Ser. No. 243,725

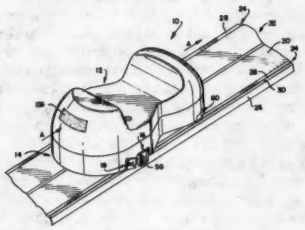
Int. Cl.[4] A63C *11/06*; B23D *67/12*

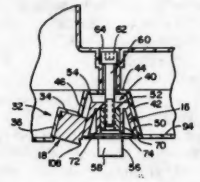
U.S. Cl. 30—169 **16 Claims**

1. A ski base flattener which is useable to remove material from the base of a ski, said ski base flattener comprising;

a body having a generally planar base surface with a scraping blade receiving slot and a blade holding wedge receiving recess formed adjacent said base surface and extending generally transverse to a direction of motion of said body along the base of the ski;

a base scraping blade removably positionable in said blade receiving slot; and





a base scraping blade holding wedge removably positionable in said recess to effect the securement of said blade in said slot.

4,884,344

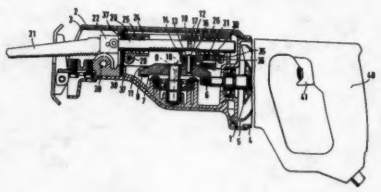
SABER SAW

David M. Martinez, New Bern, N.C., and Gordon C. Campbell, Exton, Pa., assignors to Robert Bosch Power Tool Corporation, New Bern, N.C.

Filed Aug. 29, 1988, Ser. No. 238,037

Int. Cl.[4] B23D *49/04*

U.S. Cl. 30—394 **15 Claims**



1. A saber saw, comprising an elongated displacing rod which supports a saw blade and is reciprocable in a displacement direction extending along its elongation and also swingable in a swinging direction which is transverse to said displacement direction; and means for moving said displacement in said swinging direction and including a driveable control element having a cam surface and a sensing element which is connected with said displacement rod and is controlled by said control element, said control element being rotatable about an axis of rotation, said cam surface of said control element being formed as a symmetrical conical surface which is eccentrical relative to said axis of rotation of said control element, said sensing element being arranged relative to said axial rotation of said control element at an approximately constant distance and

during rotation of said control element moves up and down on said conical surface.

4,884,345

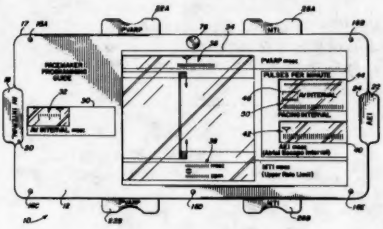
ADJUSTABLE TEMPLATE FOR PACEMAKER ECG ANALYSIS AND METHOD OF USE

Ronald J. Long, Simi Valley, Calif., assignor to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed May 12, 1988, Ser. No. 193,329

Int. Cl.[4] A61N *1/00*; H05G *00/00*; A61B *5/04*; G01B *3/02*

U.S. Cl. 33—1 C **11 Claims**



1. An adjustable template device for analyzing ECG traces, comprising:

a frame;

a first adjustable window means in said frame for indicating an AV interval;

a second adjustable window means in said frame for indicating an AE interval;

a third adjustable window means in said frame for indicating an MT interval; and

a fourth adjustable window means in said frame for indicating a PVAR period.

4,884,346

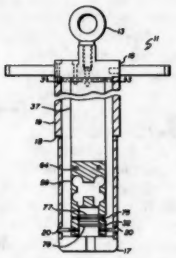
APPARATUS FOR LINEAR MEASUREMENTS

Kenneth J. Cook, Troy, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Dec. 30, 1988, Ser. No. 292,056

Int. Cl.[4] G01B *7/12*

U.S. Cl. 33—542 **3 Claims**



1. Gauging apparatus for making at least one displacement measurement comprising a unitary flexure member, said flexure member comprises a pair of spaced apart and substantially parallel body sections, each body section includes an extending portion for contacting a workpiece to be gauged, spaced apart and substantially parallel top and bottom sections join said parallel body sections forming said unitary flexure member having a central opening, said unitary flexure member includes a plurality of webs formed by a sufficiently thin section of material so as to form a hinge, each of the parallel body sections include a pair of spaced webs for permitting said top and bottom sections to move in parallel motion, said bottom section includes an additional pair of webs for permitting movement of the respective extending portions toward and away from each other and a proportional movement of the bottom section in response to such movement of the respective extending portions, a strain guage operably associated with the bottom section for sensing movement for giving an electrical signal proportional to the displacement of said respective extending portions.

4,884,347

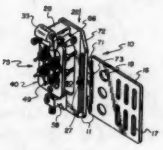
BOW SIGHT

Marlow W. Larson, Ogden, Utah, assignor to Browning, Morgan, Utah

Filed Nov. 14, 1988, Ser. No. 270,019

Int. Cl.[4] F41G *1/46*

U.S. Cl. 33—265 **8 Claims**



1. An archery bow sight comprising:

mounting structure including a first portion constituting means for connection to the handle riser of an archery bow and a second portion including a pendulum bracket which includes:

a vertical support member,

an upper horizontal member, and

a lower horizontal member,

said members defining an access window;

a pendulum pivot mount carried by said upper horizontal member;

a pendulum plate, with an upper end, pivotally suspended from said pivot mount by a pivot, a lower end, and a central portion constituting a sight pin holder, said holder including at least one sight pin slot approximately parallel said access window;

at least one sight pin assembly operably associated with said slot, said assembly including a fixture adjustably positioned in said slot, a pin shaft held by said fixture approximately transverse said slot and said window, said shaft including a first end accessible through said window and a second end carrying a distal sighting bead; and

means carried partially by said lower end of said pendulum plate and partially by said lower horizontal member for releasably locking said pendulum plate to said lower horizontal member.

4,884,348

TESTING DEVICE AND METHOD OF DETERMINING THE UNCERTAINTY OF MEASUREMENT OF COORDINATE-MEASURING INSTRUMENTS

Rudolf Zeller, Donzdorf, and Friedrich Kitzsteiner, Bopfingen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Oct. 12, 1988, Ser. No. 256,630

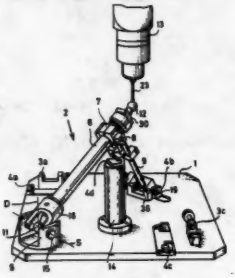
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735075

Int. Cl.[4] G01B *5/25*

U.S. Cl. 33—502 **19 Claims**

1. A testing device for determining the uncertainty of mea-

surement of a coordinate-measuring instrument having a work-contacting measurement probe, comprising a support (1) adapted for placement on the measurement table (40) of the coordinate-measuring instrument (13), said support containing a plurality of clamping elements (3*a*-*c*, 33*a*-*c*) which are adapted to receive a test standard in different orientations



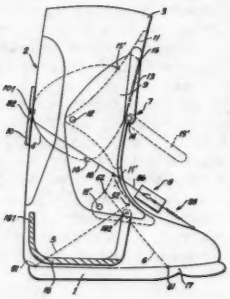
within the measurement range of the coordinate-measuring machine, characterized by the fact that the test standard is a ball rod consisting of two balls (11, 12) fastened to the ends of an elongate body (22), and that one end of the ball rod is mounted on the support (1) in a pivot/swivel bearing (5/16) which permits measuring-probe access to contact the ball (11) at said end.

4,884,349

HIGH BOOT WITH CABLES

Jean Bataille, Paris, France, assignor to Bataille Industrie, S.A., Vanves, France

Filed Jun. 2, 1988, Ser. No. 201,636
Claims priority, application France, Mar. 28, 1988, 88 04038
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—119 **10 Claims**



1. A high boot, for skiing or the like, comprising

at least one set of cables;

support and control means connected to at least one of said cables;

a heel section;

a releasable stiffening member, the releasable stiffening member and the support and control means being operative to tighten the boot or to permit opening of the boot and withdrawal of the foot from the boot, said support and control means including

a frame situated in front of the leg and provided with cradle means of support for the leg and the instep of the foot,

a rear support member receiving the calf and connected to the frame, and

an operating lever pivotally mounted on the frame to which said at least one of said cables is attached, said at least one of said cables extending through said frame and said rear support member, and other of said cables being interconnected between said frame and the boot, said lever being pivotable, at the will of the skier, between two stable positions, of which one position is taken to tension said cables and thereby to tighten said frame and said rear support member together, and another position is taken to slacken said cables to thereby release the boot, said releasable stiffening member being interconnected between a front of the boot and a rear of the boot, and being operated to stiffen or release the boot,

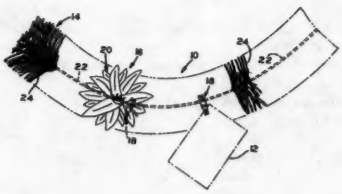
said flexible heel section linking an inner face of the boot at an ankle level with a lower part of the frame on both sides of the instep.

4,884,350

CARD DISPLAYING APPARATUS

Patricia M. Whetstone, Rte. 6, Wilson Lake, Columbia City, Ind. 46725

Filed Aug. 3, 1988, Ser. No. 227,683
Int. Cl.[4] G09F *1/10*
U.S. Cl. 40—124 **19 Claims**



1. A card-hanging apparatus for displaying a card, comprising:

an elongated support member;

clip means for attaching the card to said elongated support member, said clip means comprising a plastic, substantially flat body portion including two opposite sides and an intermediate perimeter edge, said body portion having formed therein a first slot into which the card is frictionally received for retention therein and a second slot into which said elongated support member is received to removably attach said clip means to said elongated support member, each of said first and second slots having a respective opening along said perimeter edge that extends into said body portion; and

decorative means for concealing said body portion when said card-hanging apparatus is operatively assembled, said body portion including retaining means, formed in one of said two opposite sides intermediate said first and second slots, for retaining said decorative means in snap-fitting engagement with said body portion, whereby attachment of the card to the elongated support member is decoratively concealed.

4,884,351

REFLECTIVE SIGN

Marc D. Abramson, 513 Cardinal Dr., Dresher, Pa. 19025

Filed May 31, 1988, Ser. No. 200,680
Int. Cl.[4] G09F *15/00*
U.S. Cl. 40—606 **7 Claims**

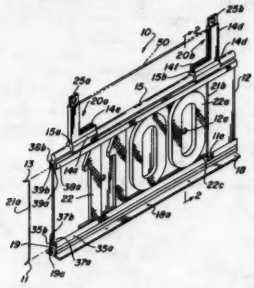
1. A sign comprising:

(a) a rectangular backing plate member having an integrally formed female cross section along its longest bottom

dimension and a male cross section along its longest top dimension, and said bottom and top dimensions further including respective upward and downward facing extensions for combining with said member to form a respective lower and upper slot;

(b) a set of reflective numerals and/or alpha characters for positioning upon said backing plate member wherein each character includes a horizontal strip positioned across a top and bottom portion for slidable engagement and positioning within said upper and lower slots, and said numerals become semi-permanently attached to said backing plate member;

(c) first and second retention members for locating within said lower and upper slots and respectively positioned on the left and right side extremeties of a plurality of said characters which are to be maintained in juxtaposition with respect to one another;



(d) a longitudinal member having a male extension for coupling with said female cross section along said longest bottom dimension of said backing plate member for maintaining said sign in an upright position;

(e) a plurality of openings formed within said longitudinal member to form passageways for receiving attaching means to firmly maintain said sign in said upright position; and alternatively,

(f) L-shaped members having female receptacles located along their respective horizontal sections for coupling with said male cross section positioned along said longest top dimension of said backing plate member, whereby one said L-shaped member being positioned at either end of said top dimension; and

(g) an opening being formed in each vertical section of each L-shaped member in order to maintain said sign in a hanging position.

4,884,352

CHANGEABLE SIGN ASSEMBLY

Robert S. Lipscomb, 2306 Brook Hollow, Wichita Falls, Tex. 76308

Filed Aug. 12, 1987, Ser. No. 84,135
Int. Cl.[4] G09F 7/02
U.S. Cl. 40—611 **2 Claims**

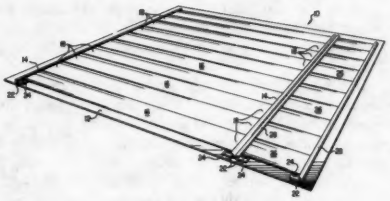
1. A changeable sign assembly comprising:

a planar base having a quadrilateral perimeter with opposite sides thereof being parallel and of equal length and adjacent sides thereof being at right angles, the base being formed of a thin, rigid sheet material;

at least four longitudinal retaining members fixed to the base, the retaining members being coparallel to two opposite sides of the base perimeter;

the said retaining members each being formed of an edge-rolled strip and having a transverse sectional configuration defined by a facing portion having a planar first side coplanar and in contact with a surface of the base, a web portion extending from a planar second side of the facing portion and having a curved concave side, and a wall portion extending from the web portion and having a planar inner side;

the second side of the facing portion, the concave side of the web portion, and the inner side of the wall portion defining a longitudinal groove in each of said retaining members, the grooves being open in an opposing relationship to each other in opposing spaced-apart pairs of the retaining members, with intermediate pairs of the retaining members being adjacent one another with the grooves being closed in opposing relationship to each other;



a plurality of elongate display members, each display member being formed of a thin, resilient sheet material and having a curved transverse sectional configuration and a linear longitudinal sectional configuration, such that two opposite long sides thereof are linear and two opposite short sides thereof are curved; and

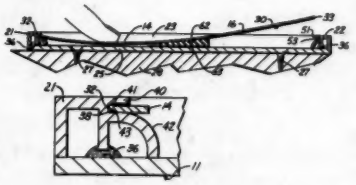
the short, curved sides of the display members being interfitted with the longitudinal grooves of the retaining members such that long sides of individual ones of the display members are adjacent and parallel, and the curved sides are flexibly deformed by the longitudinal grooves to removably retain the display members.

4,884,353

FRONT LOADING SIGN ASSEMBLY

Warren A. Taylor, 116 South Chapel Ave. 'H', Alhambra, Calif. 91801

Filed Sep. 21, 1987, Ser. No. 98,628
Int. Cl.[4] G09F 7/02
U.S. Cl. 40—611 **7 Claims**



1. A front loading sign assembly having an apparently inaccessible, easily accessible sign panel, said sign assembly including:

(a) a multi-sided sign frame lying generally in a major plane and providing a front side to be viewed and a back side, said frame including at least four frame members disposed in a multi-sided manner, a first and a second of said frame members being disposed in parallel, facing relation to each other and each having:

(1) a first sign panel confining surface effective in a plane normal to the first plane,

(2) an overhanging lip provided with a second sign panel retaining surface extending inwardly from the first panel confining surface on the viewing side of the sign frame assembly and effectively lying in parallel relation

to the first plane, and a third sign panel engaging surface extending inwardly from the first sign panel engaging surface in spaced, parallel relation to said second panel retaining surface;

(b) a flexible sign panel of substantially congruent configuration with respect to the frame assembly, said panel being partially defined by spaced-apart, mutually parallel, first and second end edges and spaced-apart, mutually parallel, third and fourth side edges, said first and second end edges being nominally slightly farther from each other than the distance between the innermost edges of the second retaining surfaces, said sign panel being insertable from the front side of the frame to be installed to lie flat and to engage the third sign panel engaging surfaces, to be confined between the first panel confining surfaces and to be retained in the frame by the second panel retaining surfaces;

(c) said frame being provided with a fulcrum adjacent to the back side of the installed sign panel at an intermediate position between the first and second frame members;

(d) the size and configuration of the frame and the flexibility of the panel being such that manual depression of the installed panel between the fulcrum and the first end edge of the panel will cause a concave bend in the depressed part of the panel and a convex bend in that part of the panel on the opposite side of the fulcrum from the first end edge of the panel resulting in a reduction of the distance between the first and second end edge portions of the panel and resulting in movement of the second end edge portion of the panel away from the first panel confining surface of the second frame member until it clears the second panel retaining surface and springs clear of the second frame member;

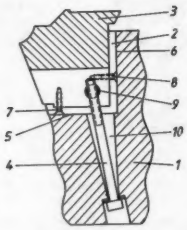
(e) wherein a third and fourth frame member are each provided with a sign panel protecting surface in adjacent, parallel, close relationship to one of the third and fourth panels side edges in position to prevent access to the undersides of said side edges of the panel when the panel is in its installed position.

4,884,354

SPORTS PISTOL

Emil Senfter, Lienz, Austria, assignor to Steyr-Daimler Puch AG, Vienna, Austria

Filed Feb. 27, 1989, Ser. No. 316,470
Claims priority, application Austria, Mar. 16, 1988, A704/88
Int. Cl.[4] F41C *23/00*
U.S. Cl. 42—73 **1 Claim**



1. A sports pistol comprising

a grip, which has a bottom portion and is formed with an open-topped, substantially prismatic recess, which is defined by two side faces on opposite sides, by a bottom surface formed by said bottom portion, and by a rear surface,

a housing extending from above into said recess and having a vertical longitudinal center plane, and

a fixing screw, which extends upwardly through said bottom portion and into said recess and holds said housing in position in said recess,

wherein

said housing defines clearances with said side faces, said bottom surface and said rear surface,

a first pair of adjusting screws are provided for supporting said housing on said bottom surface,

a second pair of adjusting screws are provided for supporting said housing on said rear surface,

the screws of each of said pairs are disposed on opposite sides of said vertical longitudinal center plane,

a rotatable member having female screw threads is disposed in said recess and mounted in said housing for rotation about an axis which is normal to said vertical longitudinal center plane,

said bottom portion is formed with a through passage, which opens into and flares toward said recess, and

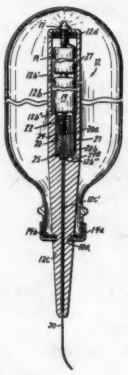
said fixing screw extends through said passage at an oblique angle to said bottom surface and at an oblique angle to said rear surface and is screwed into said female screw threads.

4,884,355

FISHING BOBBER WITH SIGNAL LIGHT

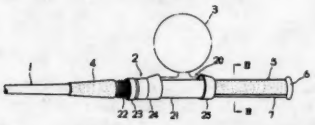
Randall L. Neihoff, 613 Cypress Cir., P.O. Box 1091, Calvert City, Ky. 42029, and Hugh R. Drewry, Jr., 3000 Knight Rd., Memphis, Tenn. 38118

Filed Nov. 25, 1988, Ser. No. 275,944
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—17 **3 Claims**



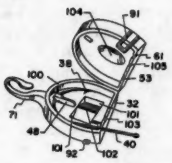
1. A fishing bobber comprising a float shell including a cap end, a cap removably secure about said cap end, and a cylindrical body disposed within said float shell and extending through a central hole of said cap, wherein cooperative means between said cylindrical body and said cap assure an assembled watertight relationship, said cylindrical body defined by a longitudinal passageway having a first portion including means at one end against which a power source is retained, a second portion receiving a longitudinally movable conductive plunger, and a third portion receiving resilient means normally urging said conductive plunger into a non-signaling condition, said conductive plunger receiving resilient means completing an electrical circuit with said power source and a light source, a conductive strip disposed within said longitudinal passageway and extending between said light source at one end thereof and into selective contact at an opposite end with said conductive plunger upon movement of the latter, and a line connected to said conductive plunger and extending through said cylindrical body at said cap end and selectively movable to electrically engage said conductive plunger with said conductive strip at a signaling condition.

4,884,356
FISHING ROD
Toshihiko Yasui, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Mar. 16, 1989, Ser. No. 324,103
Claims priority, application Japan, Mar. 17, 1988, 63-35953
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—23 **3 Claims**



1. A fishing rod, on which a fishing reel is mounted for use, comprising a rod body having a rod bottom, a reel mounting portion disposes at one circumferential side of said rod body near the end thereof, and a flexible grip mounted on said rod body behind said reel mounting portion, a sliding member having a predetermined length and formed of material wear-resistant and harder than said grip is provided on at least one surface of said grip at a side of said grip disposed opposite said reel mounting portion.

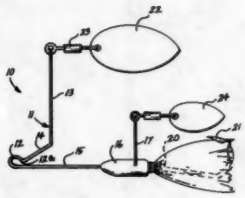
4,884,357
FISH HOOK CARRIER
James R. Clifford, 12013-22nd St., Santa Fe, Tex. 77510
Filed Oct. 28, 1988, Ser. No. 264,431
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—25.2 **13 Claims**



1. A fish hook carrier for a hook having a shank and a hook end, the carrier comprising:
a body member
a body member recess in the body member for receiving a portion of the hook including at least the hook end of the hook,
a shank notch in the body member for receiving and holding a portion of the shank
an upstanding bar protruding from the body member and spaced apart from the shank notch,
the upstanding bar projecting at an angle for holding and securing the hook on the body member,
the upstanding bar has a series of recesses for receiving hooks of different sizes.

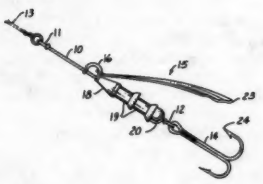
4,884,358
FISHING LURE
Darryl D. Grove, and Brenda D. Grove, both of 2101 Lexington, Beeville, Tex. 78102
Filed Feb. 16, 1989, Ser. No. 310,877
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.13 **10 Claims**

1. A fishing lure comprising,
a wire skeleton body including a securement eye defining a forward loop with a first upwardly extending leg joined to said loop and extending upwardly of said loop,
and
a rearwardly extending leg joining said loop and extending rearwardly of said loop,
and
said rearwardly extending leg terminatin rearwardly and remotely of said loop with an enlarged head member,
and
a first and second wing leg extending outwardly and orthogonally relative to said head member,
and



a hook pivotally mounted rearwardly of said head member,
and
a first spinner pivotally mounted to a free end of said upwardly extending leg,
and
a second spinner pivotally mounted to a free end of said first wing leg,
and
a third spinner pivotally mounted to a free end of said second wing leg.

4,884,359
FISHING LURE
Charles D. Wray, 64 Roehampton, Apt. 301, St. Catharines, Ontario, Canada L2M7P5
Filed Dec. 30, 1988, Ser. No. 292,102
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.19 **3 Claims**



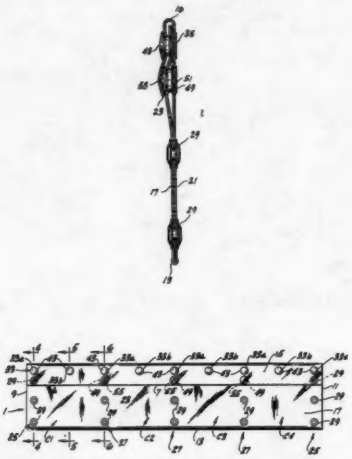
1. A fishing lure comprising:
a wire having a loop at a forward end for attachment to a fishing line and a loop at a rearward end with a multi-pronged hook secured thereto, and a plurality of loosely strung elements intermediate its length; and
a vibrating spoon-shaped blade means for producing vibrations to attract fish, said blade means being secured to said wire by a clevis passing through a hole in said blade means at a forward end thereof;
said blade means further including a first portion oriented parallel to said wire and extending forwardly from said hole and an arcuate second portion extending rearwardly and outwardly from said hole forming a transverse bend at said hole and having a convex surface facing outwardly away from said wire.

4,884,360

MULTI-COMPARTMENT RECEPTACLE FOR FISHING TACKLE OR OTHER ITEMS

Frank H. Pearcy, 4212 Beethoven, St. Louis, Mo. 63116

Filed Mar. 28, 1988, Ser. No. 173,829
Int. Cl.[4] A01K *97/06*; B65D *30/22, 85/00*
U.S. Cl. 43—54.1 **3 Claims**



1. A multi-compartment receptacle, for holding and organizing fishing tackle or other items, comprising

an elongate generally rectangular sheet of relatively heavy gauge flexible transparent sheet plastic material having first and second relatively long longitudinal edges and first and second relatively short end edges;

said sheet being folded on a first fold line extending from one end edge to the other spaced from said first longitudinal edge a predetermined distance to form a front wall for the receptacle bounded by said first longitudinal edge, said first fold line and said end edges, and a portion comprising a back wall coextensive with the front wall at the back of the front wall and a closure flap for the receptacle;

said portion being folded on a second fold line extending from one end edge of the sheet to the other spaced from said first fold line a distance corresponding generally to said predetermined distance to form said closure flap with said closure flap overlying the front wall;

said closure flap having a width less than half the height of the front and back walls;

said front and back walls being secured together along each of a plurality of lines extending heightwise thereof spaced at intervals along the length of the receptacle by a series of grommets and including a series of grommets adjacent each end of the receptacle, each grommet extending through registering holes in the front and back walls, thereby forming a plurality of compartments disposed side-by-side along the length of the receptacle;

the fold on said first fold line constituting the bottom of the receptacle and the fold on said second fold line being spaced from the bottom a distance corresponding generally to the height of the front wall and closely overlying the upper edge of the front wall with the flap extending down in front of the front wall for closing said compartments at the top thereof; and

snap fastener means along the length of the closure flap below the upper edge of the front wall for releasably securing the flap in position closing each compartment and allowing the portion of the flap closing each compartment to be opened individually;

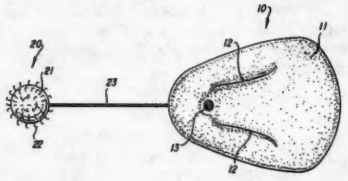
wherein the snap fastener means comprises snap fasteners in line with each series of grommets and snap fasteners midway of the series of grommets, and wherein the snap fastener means comprises snap fasteners having elements secured to the back wall and projections extending from said elements through holes in the front wall and elements secured to the flap having recesses receiving said projections.

4,884,361

METHODS AND APPARATUS FOR CONTROLLING ARTHROPOD POPULATIONS

Daniel Sonenshine, Virginia Beach, and James G. C. Hamilton, Norfolk, both of Va., assignors to Center for Innovative Technology, Herndon, Va.

Filed Jul. 8, 1987, Ser. No. 71,170
Int. Cl.[4] A01M *1/02, 1/20*
U.S. Cl. 43—132.1 **13 Claims**



1. An article of manufacture for attracting and destroying arthropods comprising: a decoy arthropod, an effective amount of at least one pesticide in association with said decoy, a sufficient amount of at least one volatile sex attractant pheromone in association with said decoy to attract an arthropod to said decoy, and a sufficient amount of at least one mounting pheromone in association with said decoy to induce physical contact between an arthropod and said decoy.

13. A method for controlling arthroped populations which comprises:

placing at least one arthroped decoy in a location where it is desired to control the arthroped population said decoy having a volatile sex attractant pheromone, a mounting pheromone and a pesticide in association with said decoy;

attracting arthropods to said decoy by means of said volatile sex attractant phermone; inducing physical contact between said decoy and said arthroped by means of said mounting phermone thereby causing contamination of said arthroped with said pesticide.

4,884,362

METHOD AND APPARATUS FOR APPLYING LIQUID CHEMICALS TO PLANTS

Steven W. Speidel, Rte. #8, Lincoln, Nebr. 68506

Continuation of Ser. No. 775,102, Sep. 11, 1985, abandoned, which is a continuation of Ser. No. 493,437, May 11, 1983, abandoned, which is a continuation of Ser. No. 222,935, Jan. 6, 1981, abandoned. This application Oct. 4, 1988, Ser. No. 253,410
Int. Cl.[4] A01G *13/00*
U.S. Cl. 47—1.5 **14 Claims**

1. An applicator for applying a liquid chemical to plants comprising:

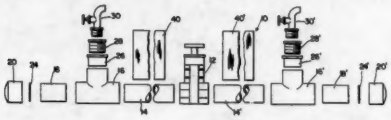
an elongate hollow body, having end closures, which body contains a liquid chemical; said elongate body being transportable nonrotatably through the plants parallel to the ground and in a direction transverse to the length of said elongate body so that said elongate body has a bottom, a top, a leading side, and a trailing side;

a fill opening in said elongate body through which the chemical is admitted to the interior of said elongate body;

a row of bottom holes generally equally spaced from each other along the bottom of said elongate hollow body;

a row of side holes located on the leading side of said elongate body at a position higher than said row of bottom holes; said side holes being spaced from each other, generally midway between adjacent bottom holes, and larger than said bottom holes;

a canvas cover tightly wrapped around said elongate body



so as to lie directly against the surface thereof and over and against said holes and form the outer wiping surface of the applicator; and

an adjustable air valve in fluid communication with said elongate body through which air is admitted to the interior of said elongate body to control the seeping of the chemical from the interior of said elongate body through said bottom and side holes and into said canvas cover;

such that as the applicator is passed through the plants, the chemical which seeps into said canvas cover is wiped onto the plants.

4,884,363

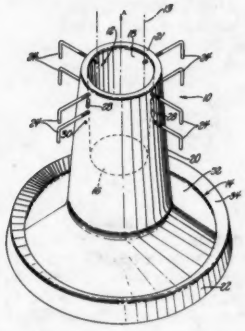
TREE STAND

Hugh M. Sofy, 201 Warrington, Bloomfield Hills, Mich. 48013

Continuation of Ser. No. 107,546, Oct. 13, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 281,921

Int. Cl.[4] A47G *33/12*

U.S. Cl. 47—40.5 **11 Claims**



1. A tree stand device for supporting a tree in an upright posture, said device (10) comprising; a receptacle (12) including an upwardly extending peripheral wall (18), an axis (A) extending centrally through said receptacle (12), a skirt (20) extending outwardly and downwardly about the exterior of said peripheral wall (18) at a first predetermined acute angle relative to said axis (A), said device (10) characterized by including a base means (14) extending outwardly and downwardly from said skirt (20) at a second predetermined acute angle relative to said axis (A) which is larger than said first angle for providing a large area of support to said device (10), a plurality of bolts (24) extending inwardly through said skirt (20) and said peripheral wall (18) of said receptacle (12) and disposed circumferentially about said receptacle (12) with at least two of said bolts (24) being spaced axially from one another, and support webs (26) associated with and surrounding each of said bolts (24) disposed between said peripheral wall (18) and said skirt (20).

4,884,364

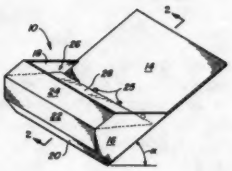
METHOD AND APPARATUS FOR CUT FLOWER STORAGE AND DISPLAY

John Ferris, 1506 19th St., Sacramento, Calif. 95814

Continuation-in-part of Ser. No. 927,648, Nov. 5, 1986. This application Mar. 11, 1988, Ser. No. 166,993

Int. Cl.[4] A01G *5/00*

U.S. Cl. 47—41.01 **17 Claims**



1. A method for prolonging the useful life of fresh cut flowers in a bud-like or closed state comprising:

arranging fresh cut flowers in a plurality of cut flower storage and display containers positioned in a vertically stacked relationship forming at least one generally vertical column, each of said containers supported at an angled orientation from the horizontal, and each said cut flower storage and display container having a liquid reservoir and a flower supporting portion;

circulating liquid from a primary reservoir to an uppermost storage and display container in each said generally vertical column;

filling said liquid reservoir of said uppermost storage and display container in each said generally vertical column to a threshold liquid level;

maintaining said threshold liquid level in said uppermost storage and display container in each said generally vertical column by discharging liquid from said uppermost storage and display container after said threshold liquid level is attained to said liquid reservoir of the adjacent lower storage and display container;

filling said liquid reservoirs of each said container in each said column sequentially to said threshold liquid level and maintaining said threshold liquid level in each said container by discharging liquid to said liquid reservoir of the adjacent lower container after said threshold liquid level is attained;

collecting liquid discharged from a lowermost container in each said generally vertical column in said primary reservoir for recirculation; and

separately cooling said liquid to temperatures of about 32° to about 50° F., thus to maintain blooms of the flowers in the budlike or closed state for a longer period of time.

4,884,365

DEVICE FOR COLLECTING SAP

Dominique Lesquir, Buckland, Canada, assignor to IPL Inc., Quebec, Canada

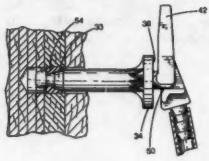
Filed Mar. 27, 1989, Ser. No. 329,404

Int. Cl.[4] A01G *21/10*

U.S. Cl. 47—52 **14 Claims**

1. A device for collecting sap from trees and for directing said sap to a sap-collecting system operable under vacuum conditions, comprising: a first member having a hollow sap-collecting section and a hollow sap-discharging section, said sap-collecting section having an open end adapted to be inserted into a cavity formed in the outer layers of a tree to be sap-collected and displaying thereon an annular recess which is

disposed in said layers when said sap-collecting section is engaged in a tree; expansible sealing means secured in said recess to provide a sealing engagement with said tree layers to prevent air infiltration in said member from said open end when said sap-collecting system is operating under vacuum



conditions; a second member mounted over part of said sap-collecting section and having one end disposed adjacent said sealing means; means cooperating between said first and said second members for causing said second member to force said sealing means to expand to sealingly secure said device in said tree.

4,884,366

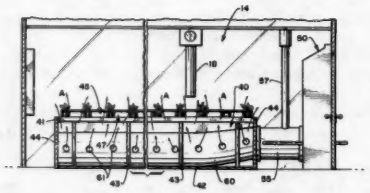
MICRO-CLIMATE PLANT GROWING SYSTEM

George J. Morton, P.O. Box 163, Somis, Calif. 93066

Filed Sep. 16, 1988, Ser. No. 245,584

Int. Cl.[4] A01G *31/00*

U.S. Cl. 47—62 **18 Claims**



1. A system for climatizing plants comprising:

a plenum chamber defined by an enclosed framework with an open top;

two or more troughs containing plants extending across said open top, said troughs having opposing side panels with adjacent troughs separated by a space which forms an air passage in communication with said chamber, said air passage located between corresponding side panels of adjacent troughs;

a deflector plate supported by said frame work and extending between a adjacent pairs said troughs and thereby covering a portion of said space to form air outlets in communication with said chamber whereby said panels and said deflector plate direct air past said plants; and,

air means for pressurizing said plenum chamber with conditioned air and causing said conditioned air to flow through said passages and past said plants.

4,884,367

ROOT CONTROL BAG

Peter A. Lawton, Berwick, Australia, assignor to W & G Precision Instruments Pty. Ltd., Australia

Filed Oct. 20, 1988, Ser. No. 260,248

Claims priority, application Australia, Oct. 21, 1987, P14995; Jul. 14, 1988, P19302

Int. Cl.[4] A01G *9/02*

U.S. Cl. 47—78 **9 Claims**

8. In a method for growing plant stock for later transplantation the specific improvement comprising:

(a) excavating a hole in the ground

(b) inserting within the hole a root control bag having a wall manufactured from a non-woven fabric formed of a multiplicity of substantially continuous, randomly aligned, polymeric fibres, needle puncture bonded together, the physical characteristics of said fabric being such that when subjected to a set of standard probe penetration tests as hereinbefore defined in not more than 33⅓% of the tests is the initial resistance to puncture greater than 1 kg, and in not more than 2% of said tests is the final resistance to final penetration less than 1.25 kg, said fabric having a resistance to deterioration such that no significant deterioration of said physical characteristics is shown over a period of prolonged use under normal conditions.

(c) filling said bag with growing media, and

(d) growing a plant within said bag in the ground such that the bag and the growing plant can thereafter be excavated from said ground and transported for transplantation elsewhere.

4,884,368

MEANS FOR FORCING APART TWO STRUCTURAL MEMBERS OF A CLOSURE ARRANGEMENT

David J. Thornley, Ryton; Moira A. Smith, Newcastle; Philip Dale, Hexham; Samuel H. Leask, South Shields, and Ian M. Coutts, Preston Grange, all of United Kingdom, assignors to The Marconi Company Limited, Stanmore, United Kingdom

Filed Jan. 10, 1989, Ser. No. 295,694

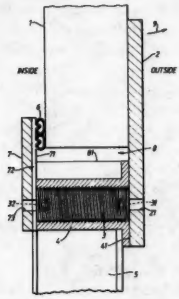
Claims priority, application United Kingdom, Jan. 13, 1988, 8800725

Int. Cl.[4] E05F *11/00*

U.S. Cl. 49—276 **10 Claims**

1. A closure arrangement comprising: first and second structural members having mutually engageable edges and being relatively moveable between an open position, at which the edges are spaced apart, and a closed position, at which the edges are in overlapping engagement in a plane normal to the direction in which they first separate when moved towards their open position; a resiliently deformable seal fixed to one of the structural members; and a stud in threaded engagement with a bore in the edge of the first structural member for free rotation therein such that, in use, its rotation causes an axial

end face of the stud to project from the surface of the edge of the first structural member and to bear upon the edge of the



second structural member thereby forcing apart the first and second structural members.

4,884,369

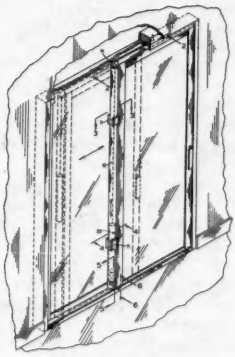
SLIDING DOOR CLOSER

Gerald F. Tatham, 1391 W. Shaw Ave., Fresno, Calif. 93711

Filed Mar. 31, 1989, Ser. No. 332,522

Int. Cl.[4] E05D *15/06*; E05F *1/00*

U.S. Cl. 49—404 **5 Claims**



1. A door or window closing mechanism comprising:

(a) A hollow cylindrical tube;

(b) A weight disposed within said tube;

(c) A port means at the bottom of said tube;

(d) A pulley attached to the top of said tube;

(e) A cable means attached to the top of said weight stretched across said pully and attached in an appropriate location on the door or window header; and

(f) A pneumatic seal provided on the lower portion of said weight intermediate its ends between the outer circumfrential surface of the weight, and the internal circumfrential area of the tube, said seal having a deformable tapered edge so that air may freely pass the weight as it is raised in the tube, but may not pass the weight as it drops in the tube.

4,884,370

WEATHER STRIP FOR USE IN AUTOMOBILE

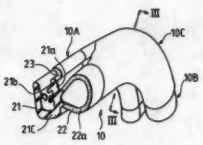
Masahiro Nozaki, and Atusi Hikosaka, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Feb. 13, 1989, Ser. No. 309,218

Claims priority, application Japan, May 18, 1988, 63-65675[U]

Int. Cl.[4] E06B *7/16*

U.S. Cl. 49—479 **3 Claims**



1. A weather strip for mounting relative to a periphery of a door opening in an automobile which strip comprises an elongated body including (i) a longitudinal trim portion of a U-shaped cross-section for being fitted on a peripheral flange formed on the periphery of the door opening, said trim portion being defined by a pair of opposed arms and a base interconnecting said arms at their one ends, (ii) a hollow seal portion formed on an outer face of one of said opposed arms of said trim portion and extending therealong, a door of the automobile being adapted to be sealingly engaged at its peripheral edge portion with said seal portion, and (iii) a sealing lip for sealing engagement at its distal edge with a surface defining the door opening;

said strip body comprising two straight elements of rubber and a corner element of molded rubber interconnecting said straight elements at their one ends and molded integrally therewith;

the sealing lip of said straight element being formed on the other end of said one arm of said trim portion; and

the seal portion of said corner element having one longitudinal edge portion disposed in spaced, opposed relation to said other end of said one arm of said trim portion of said corner element at a region intermediate opposite ends of said seal portion to form a longitudinal opening therebetween, said one longitudinal edge portion being integrally continuous with said sealing lip of each straight element so as to serve as said sealing lip of said corner portion, said longitudinal opening being used for removing a core from said corner element after the molding of said corner element.

4,884,371

CORNER CONNECTOR FOR SLIDING DOORS

Laurent Gagnon, Thornhill, Canada, assignor to DSH, Concord, Canada

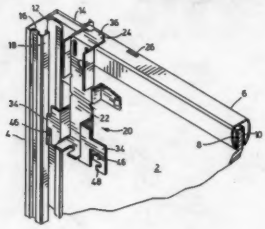
Filed Feb. 3, 1989, Ser. No. 306,091

Int. Cl.[4] E06B *3/00*

U.S. Cl. 49—501 **11 Claims**

1. A corner connector bracket for connecting a rail and a stile at the corner of a panel of a sliding door, the rail and stile each having channels to engage the panel, comprising a body defining a generally channel shaped, vertically extending and rearwardly facing recess having a forward wall and side walls, means for locating in the recess a vertically extending arm having a guide element supported at a distal end thereof, a first land at one vertical end of said front wall, said land being engageable with said rail at a rear side thereof, a first forwardly extending flange at said one vertical end of said forward wall, a distal end of the flange being inturned to form a first tongue extending vertically towards the other end of the body, said first tongue being engageable in a slot formed in a horizontal surface of said rail and forwardly of the channel therein, sec-

ond flanges extending forwardly from each side of said forward wall at locations spaced from said one vertical end, distal ends of said second flanges being out-turned to form second lands engageable with the rear surface of the panel, and barbed



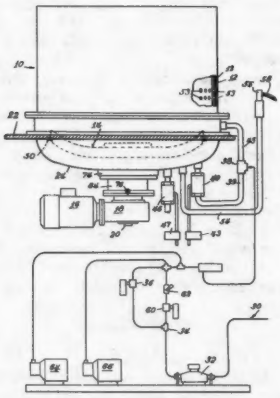
second tongues extending laterally outwards from said side walls at locations thereon spaced from said one vertical end and to the rear of said second flanges, one of said tongues being lockable into a slot defined in the stile.

4,884,372

CENTRIFUGAL FINISHING APPARATUS EMBODYING IMPROVED SEAL AND METHOD

Gary L. McNeil, Allegan, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Filed Oct. 6, 1987, Ser. No. 105,273
Int. Cl.[4] B24B *8/00*
U.S. Cl. 51—163.2 **17 Claims**



1. Apparatus for finishing parts or workpieces by attrition with loose, comminuted, granular, or particulate solid finishing material in the presence of a liquid vehicle, which includes:

a finishing chamber having an internal cavity and containing surfaces comprising

an outer upstanding wall member and an imperforate bottom member, said upstanding wall member and said bottom member being symmetrically arranged bout a common axis and said bottom member being rotatable about said axis in order to impart motion to the contents of said chamber for finishing of said parts or workpieces therein, and means for causing such motion,

said outer wall member and said bottom member having closely-spaced apposed surfaces with seal means therebetween,

characterized in that

said seal means comprises a resiliently-restricted zone around the periphery of said bottom member, said zone being defined by a resilient bottom-forming element on said bottom member and upwardly-extending side walls formed by complementary upwardly-extending surface on said bottom member and on said upstanding wall member, said resilient bottom-forming element extending outwardly beyond the upwardly-extending surface on said bottom wall, and;

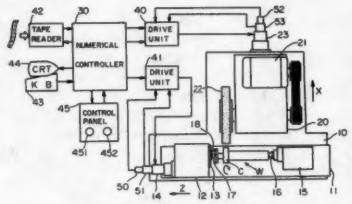
means for providing fluid into said resiliently-restricted zone and for maintaining said fluid under a sufficient pressure to force said fluid to enter into said resiliently-restricted zone and thence upwardly into said finishing chamber internal cavity around the periphery of said bottom member and said bottom-forming element.

4,884,373

NUMERICALLY CONTROLLED MACHINE TOOL

Ikuo Suzuki, Chiryu; Takao Yoneda; Takayuki Hotta, both of Nagoya, and Toshihiro Yonezu, Nishio, all of Japan, assignors to Toyoda-koki Kabushiki-kaisha, Kariya, Japan

Filed Sep. 18, 1987, Ser. No. 98,186
Claims priority, application Japan, Sep. 22, 1986, 61-224269
Int. Cl.[4] B24B *51/00*
U.S. Cl. 51—165.71 **3 Claims**



1. A numerically controlled machine tool, which has a main spindle and tool slide controlled numerically, for grinding a non-circular workpiece according to a profile data which defines a profile generating movement of a tool along the final shape of said non-circular workpiece, said numerically controlled machine tool comprising:

ideal profile memory means for storing ideal profile data, which is calculated from said ideal final shape of said workpiece, and composed of position data of said tool with respect to the rotational position change of said main spindle;

execution profile data memory means for storing execution profile data calculated from said ideal profile data and which is compensated for position error due to follow delay of said numerically controlled machine tool;

control means for moving said spindle and said tool slide according to said execution profile data so as to reproduce profile generation movement;

measuring means for detecting instantaneous positions of said main spindle and said tool slide during said profile generating movement;

means for producing measured profile data based upon said detected positions of said main spindle and said tool slide, wherein said measured profile data is composed of measured position data of said tool with respect to the rotational position change of said main spindle;

means for calculating the difference between said position data of said ideal profile data and said measured position data of said measured profile data; and

decision means for ascertaining whether or not the follow delay is within a predetermined tolerance based upon said difference calculated by said calculating means.

4,884,374

ASBESTOS REMOVAL GLOVE

Anthony Natale, Mt. Holly, and Thomas Natale, Moorestown, both of N.J., assignors to GPAC, Inc., Maple Shade, N.J.

Filed Oct. 1, 1987, Ser. No. 103,150
Int. Cl.[4] B24D *15/04*
U.S. Cl. 51—391 **5 Claims**

1. An asbestos removal glove comprising:

two relatively flexible side surfaces secured to one another and defining an opening therebetween for insertion of a hand of an operator to cover the operator's fingers, thumb, and palm,

a plurality of metal needles spaced along and projecting from one of said two sides surfaces in at least the palm area of said one side surface, said metal needles having a diameter and length to provide sufficient stiffness and length to strip asbestos-containing materials from structural members upon application of pressure by the hand of the operator located within the glove which structural members may include a source of electric current, and

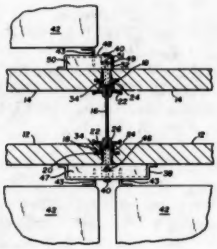
electrical insulation means located in said glove between said two side surfaces for insulating said metal needles from the hand of the operator when in the glove to prevent transfer of an electrical shock to the operator upon accidental contact by said metal needles with the source of electric current.

4,884,375

SYSTEM FOR MOUNTING FURNITURE ON WALLBOARD PARTITIONS

Alan C. Wendt, Barrington, Ill., assignor to USG Interiors, Inc., Chicago, Ill.

Filed May 16, 1985, Ser. No. 734,662
Int. Cl.[4] A47B *57/10*; E04B *2/60*
U.S. Cl. 52—36 **6 Claims**



1. An improved system for hanging furniture on a wallboard partition, the partition comprising a stud having a bifurcated web and flanges extending laterally from the web, the web having a plate portion and first and second longitudinal channel housings extending in tandem from the plate, the first channel housing being proximate to the plate and defining a screw-receiving groove, the second channel being wider than the first and having an unobstructed mouth distal to the plate, and wallboard panels supported by the flanges and separated laterally by the channel housings;

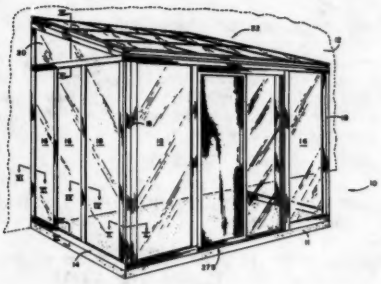
the improvement comprising a support cleat nested within the second channel housing, a screw passing through the cleat and into the groove, and an upright slotted standard straddling the second channel housing in abutment with the faces of the wallboard panels and supported by the cleat.

4,884,376

SUN PORCH

David A. DeBlock, and Kert E. Artwick, both of Holland, Mich., assignors to ODL, Incorporated, Zeeland, Mich.

Filed Oct. 13, 1987, Ser. No. 107,796
Int. Cl.[4] E04B *7/04*
U.S. Cl. 52—90 **22 Claims**



1. A sun porch especially adapted to be added to an existing building structure, said sun porch comprising:

a plurality of generally identical interfitting window panels each including a frame having a male side member and a female side member, all of said male side members being generally identical to one another and all of said female side members being generally identical to one another, each female side member being adapted to receive one of said male side members such that each said female side member confines said received male side member against movement relative thereto in only three directions;

a corner post means for receiving two nonparallel window panels, said corner post means extending substantially the full height of said window panels, said corner post means including a female portion for receiving one of said male side members such that said male side member is confined therein against movement relative thereto in only three directions and a male portion for receiving thereover one of said female side members such that said male portion is confined therein against movement relative in only three directions, said corner post means thereby enabling two of said window panels to meet in a corner; and

base means for supporting said window panels above a support surface, said base means defining one of a male structure or female structure and said window panel frames each having lower edges defining the other of said male or female structures, said female structures being adapted to receive said male structures such that said female structures confine said received male structures against movement relative thereto in only three directions.

4,884,377

REMOVABLE TENSION MEMBER

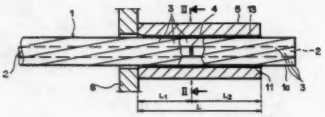
Peter Matt, Ittigen, Switzerland, assignor to VSL International AG., Bern, Switzerland

Continuation of Ser. No. 41,535, Apr. 23, 1987, abandoned. This application Mar. 6, 1989, Ser. No. 320,843

Claims priority, application Switzerland, Apr. 28, 1986, 1721/86

Int. Cl.[4] E04B *1/38;* E02D *5/80*

U.S. Cl. 52—98 16 Claims



1. A tension member to be anchored in the ground or in a structure, comprising:

a central element,

a plurality of further elements surrounding the central element, at least the central element being completely severed in a predetermined zone thereof, to form a point of separation, and

a supporting means applied around the tension member at said predetermined zone, wherein the distance to the point of separation of said central element from the end of said predetermined zone measured in the direction of an applied load is fixed according to the magnitude of the load to be exerted on said predetermined zone for removal of said tension member from an anchored position.

4,884,378

STRUCTURAL ASSEMBLY FOR PRODUCING WALLS

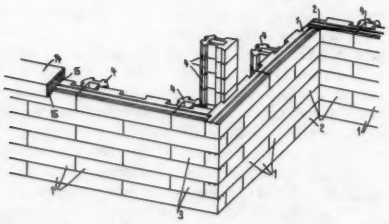
Rolf Schelwiller, Lindeneggweg 10,, CH-3645 Gwatt, Switzerland

Continuation of Ser. No. 17,248, Feb. 20, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 220,401

Claims priority, application European Pat. Off., Feb. 21, 1986, 86810092.6

Int. Cl.[4] E02D *5/20*

U.S. Cl. 52—169.4 26 Claims



1. A structural assembly comprising:

a plurality of primary elements each comprising a parallelepiped shaped primary body section having an anchoring face, at least one primary protrusion on said anchoring face for anchoring said primary element to a steep incline, said at least one primary protrusion being disposed in a primary connecting face of said primary body section, and primary connecting areas disposed on said primary connecting face adjacent to said at least one primary protrusion;

a plurality of cornering elements for establishing an angled connection with said primary elements, each such element comprising a parallelelepiped shaped cornering body section having a cornering connecting face, a cornering protrusion disposed on said cornering connecting face, and first and second cornering connecting areas disposed on said cornering connecting face on adjacent sides of said cornering protrusion;

wherein said primary connecting areas are adapted to be aligned adjacent to one another and adjacent to said second cornering connecting area, thereby forming grooves between pairs of adjacent cornering and primary protrusions; and

a plurality of tubular securing means for engaging said grooves and firmly securing said anchoring faces to a steep incline.

4,884,379

SKYLIGHT STRUCTURE AND METHOD OF MANUFACTURE THEREFOR

Lance C. McCabe, San Clemente, Calif., assignor to Bristol Fiberlite Industries, Inc., Santa Ana, Calif.

Filed Feb. 22, 1988, Ser. No. 158,452

Int. Cl.[4] E04B *7/18;* E06B *7/08*

U.S. Cl. 52—200 7 Claims

1. A louvered panel for a skylight mounted substantially parallel to a roof of a building around an aperture in the roof for permitting ambient light to enter the building while preventing precipitation from entering through the skylight, the panel comprising:

a louvered main section and a louvered extension section, the louvers of the main and extension sections being substantially aligned and having means thereon for interconnection of respective pairs of aligned louvers for forming a plurality of open louvers having angles and spacings which preclude any path therebetween which is about perpendicular to said panel.

4,884,380

MOLDING AND METHOD OF PRODUCING THE SAME

Yukihiko Yada, and Toshiaki Kishio, both of Aichi, Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Oobu, Japan

Filed Dec. 22, 1988, Ser. No. 288,274

Claims priority, application Japan, May 17, 1988, 63-120385

Int. Cl.[4] E06B *3/00*

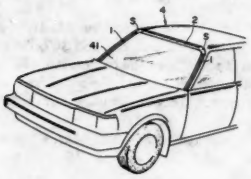
U.S. Cl. 52—208 7 Claims

1. A molding having connection with high strength comprising:

two moldings connected with each other, each of said two moldings including a decorative trim portion as an outer part and being provided therein with a core material having a notched portion with at least one concave portion and at least one convex portion; and

a connecting portion for connecting said two moldings, said connecting portion including a connecting decorative trim portion of which the cross sectional shape is continuously varied so as to continuously connect the cross sectional shape of one of said two moldings and that of the other of said two moldings;

said respective notched portions of said two moldings being engaged with each other, and the periphery of said en-



gaged portions being molded into one body as said connecting decorative trim portion so as to form said connecting portion.

4,884,381

STRUCTURAL JOINT SYSTEM

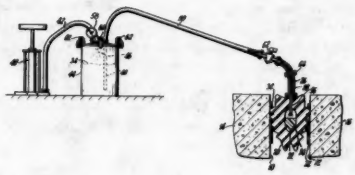
Pier L. Betti, Sao Paulo, Brazil, assignor to Jorge Gabrielli Zacharias Calixto, Sao Paulo, Brazil

Continuation of Ser. No. 585,620, Mar. 6, 1984, abandoned, which is a continuation of Ser. No. 271,988, Jun. 9, 1981, abandoned, which is a continuation of Ser. No. 29,105, Apr. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 939,207, Sep. 5, 1978, abandoned, which is a continuation of Ser. No. 803,852, Jun. 6, 1977, abandoned. This application Sep. 26, 1988, Ser. No. 249,195

Claims priority, application Brazil, Jun. 10, 1976, 7603818

Int. Cl.[4] E04B *1/68;* E01C *11/02, 11/10*

U.S. Cl. 52—741 1 Claim



1. A method for forming a sealed joint between a pair of opposed concrete surfaces forming a gap therebetween comprising the steps of:

locating in said gap between said opposed surfaces an elongated, tubular sealing element consisting of resilient material having first and second side walls juxtaposed respectively against said surfaces, said side walls having a depth less than the thickness of said surfaces and said element having a cavity internally thereof and a plurality of closely-spaced, longitudinal ribs formed in said side walls, said ribs having a distance therebetween less than one-third the depth of said side walls and forming narrow adhesive-receiving grooves therebetween;

applying between said side walls and said opposed surfaces an epoxy resin adhesive material capable of setting after expiration of a set period of time following its application to form a firm adhesive bond between said sealing element and said opposed surfaces;

subjecting said cavity to a gas under pressure after applying said adhesive to cause said sealing element to undergo flexure as a result of the introduction into said cavity of said pressurized gas to compress said adhesive between said side walls and said opposed surfaces during setting of said epoxy resin; and p1 maintaining said gas pressure within said cavity until expiration of said set period of time.

4,884,382

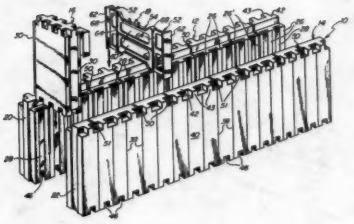
MODULAR BUILDING-BLOCK FORM

David D. Horobin, 1640 S. Claudina Way, Anaheim, Calif. 92805

Filed May 18, 1988, Ser. No. 195,641

Int. Cl.[4] E04C *1/14, 2/00*

U.S. Cl. 52—426 3 Claims



1. An improved, modular, concrete block form assembly wherein the assembly is formed in combination with strut members, said combination comprising:

a pair of oppositely disposed side panel members each having an inner and outer surface and vertically disposed interlocking end members;

interlocking means formed along the upper and lower longitudinal edges of said panels, said interlocking means being formed so that said upper and lower edges are interlocked with each other when said assemblies are stacked one on top of the other;

a plurality of equally spaced tongue-and-groove members vertically formed in said inner surface of said panels;

a plurality of T-shaped mortises spaced apart from each other and vertically located in said side panels, said T-shaped mortises being defined by transverse slots formed in vertical tongue members and longitudinally disposed head slots, said mortises extending to a midway point of each of said side panels;

a strut members having a web midsection and an H-shaped tenon member formed at each of the securing ends of said web midsection so as to be received in said respective mortises, said midsection of said strut member being formed having a plurality of truss members that define a plurality of flow-through openings formed therein to provide for an unobstructed flow of concrete therebetween;

said H-shaped tenon members being integrally formed with said truss members, and each tenon member including an outer stud member and an inner stud member integrally connected by a web frame member, wherein said outer stud member of each of said tenons is formed having a wedge-shaped configuration so as to be forcibly positioned in said head slot to provide a locking arrangement therewith, said inner stud being positioned against said inner surface of said side panels, thereby preventing movement relative thereto, and wherein said web frame member thereof is located within said transverse slot whereby longitudinal movement between said opposed panels is prevented.

4,884,383

CEILING PANEL CARRIER ADAPTER MEMBER

Willem Rijnders, Papendrecht, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands

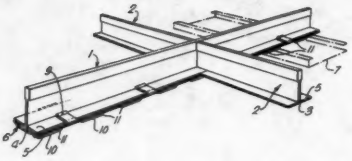
Continuation-in-part of Ser. No. 43,911, Apr. 29, 1987, Pat. No. 4,781,005. This application Jun. 27, 1988, Ser. No. 211,801

Claims priority, application United Kingdom, Apr. 28, 1987, 8709964

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] E04B 5/52

U.S. Cl. 52—489 11 Claims



1. An adapter member for attaching ceiling panels to a support member of a ceiling construction which includes;

(a) a ceiling support grid including main support members and cross-support members, said support members each including at least one laterally extending lower part, having a longitudinally extending lower surface and a lateral longitudinally extending free edge;

(b) a plurality of ceiling elements; and

(c) adapter members for connecting the elements to support members of the support grid; said adapter member including:

(1) opposite elongated side edges and a central elongated body portion for parallel engagement with the lower surface of the main support member,

(2) upwardly directed arm means bent over and extending above the body portion to define clip means for attaching the adapter member to said longitudinal free edge of the main support member,

(3) downwardly directed ceiling element attachment means for engagement with the ceiling elements,

(4) said arm means including a plurality of first flange portions spaced along one side edge of the elongated adapter member,

(5) the spacing between the first flange portions along said one side edge being correlated with the pitch and dimensions of the cross support members so that said first flange portions will not coincide with said cross support members,

(6) upturned spaced further flange portions extending along the opposite longitudinal side edge of the support member from said one side edge for limiting any transverse movement of the adapter member with respect to the support member, and

(7) the spaces between the further flange portions along said one side edge being positioned so as to correlate with the pitch of the cross-support members at the relevant side and being dimensioned so as not to interfere with said cross-support members, if connected.

4,884,384

ARRANGEMENT FOR LAYING CONCRETE FLOORS

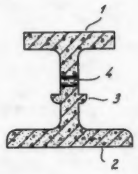
Stig-Åke Ljungkvist, Skövde, and Lennart Johansson, Mariestad, both of Sweden, assignors to Permaban Southeast, Inc., Matthews, N.C.

Continuation of Ser. No. 895,516, Aug. 11, 1986, abandoned, which is a continuation of Ser. No. 795,187, Nov. 15, 1985, abandoned, which is a continuation of Ser. No. 685,600, Dec. 26, 1984, abandoned, which is a continuation of Ser. No. 309,885, Oct. 5, 1981, abandoned. This application Apr. 6, 1987, Ser. No. 35,217

Claims priority, application Sweden, Mar. 4, 1980, 8001663-7

Int. Cl.[4] E04G 21/10

U.S. Cl. 52—741 7 Claims



1. A method of producing a concrete floor over a base of material such as sand with at least (a) pourable concrete, (b) a plurality of combination concrete forming and screed guiding beams, the beams being formed of at least precast concrete, and each having flanges, a beam web and a slide face, the flanges being adapted to be anchored to the base, the beam web joining the flanges and side face the slide face adapted to support a screed and become a part of the concrete floor surface, the width of the beam at the beam web being narrower than the width of the beam at the flanges at least along portions of the beam and narrower than the width of the beam at the slide face along portions of the beam, the width of the beam at the flanges being wider than the width of the beam at the slide face at least along portions of the beam and (c) a concrete screed, the method comprising the steps of:

first, locating the plurality of beams in a pattern over the base of material such as sand, with the flanges down in relation to the slide faces, the beams being spaced in the pattern at distances for pairs of the slide faces supporting the screed during screeding;

second, levelling the beam slide faces at heights such that the slide faces are coplanar with the desired concrete floor surface and anchoring the flanges of the plurality of beams in the pattern on the base of material such as sand with the beam slide faces maintained at said heights;

third, pouring the concrete among the plurality of beams in the pattern over the base in sufficient quantity to fill among the beams to the heights of the slide faces;

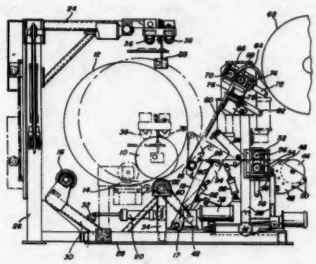
fourth, screeding the poured concrete among the beams in the pattern to the heights of the slide faces with the screed supported during the screeding on pairs of slide faces of the beams in the pattern; and

fifth, hardening the poured and screed concrete into a hardened concrete floor having a hardened concrete floor surface while maintaining the plurality of beams in the pattern during hardening, and hardening the plurality of beams into the floor and thereby causing the plurality of beams to become a permanent loadbearing part of the hardened concrete floor and causing the beam slide faces to become a permanent part of the hardened concrete floor surface whereby the plurality of beams are not removed, which reduces the time and therefore the cost of producing the concrete floor.

4,884,385
INTERLEAVED SPIRAL WRAPPING OF FOAM PRODUCT AND STRETCH FILM FOR PACKAGING CARBONLESS PAPER ROLLS

Roger J. Mushinski; Charles E. Lewis, and Lawrence J. Casey, all of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Mar. 4, 1987, Ser. No. 21,919
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—399 **13 Claims**



1. A process for producing a foam wrap package for protecting a roll of carbonless paper, consisting essentially of the steps of:

feeding a layer of stretch film from a single source of stretch film toward a roll of carbonless paper in a wrapping position;

feeding a layer of packaging foam from a single source of packaging foam toward said roll of carbonless paper in said wrapping position;

simultaneously wrapping under tension interleaved layers of said single stretch film and packaging foam onto a roll of carbonless paper;

terminating the wrapping of said packaging foam onto said roll of carbonless paper; and

terminating the wrapping of said stretch film onto said roll of carbonless paper subsequent to the step of terminating the wrapping of said packaging foam to form a roll package having multi-layers formed from two webs surrounding the roll.

4,884,386
SYSTEM FOR RECOVERING, SELECTING AND RECYCLING REJECTED PLASTIC CONTAINERS

Gulmini Carlo, Casumaro, Italy, assignor to Govoni, SpA, Ferrara, Italy

Filed Nov. 22, 1988, Ser. No. 275,001
Int. Cl.[4] B65B *63/02, 63/08, 13/20*
U.S. Cl. 53—438 **12 Claims**

1. A system for recovering, selecting and recycling rejected or used plastic containers, comprising:

a first operational sequence means for squeezing the container including a unit having an input device consisting of a lid (2) provided with an opening (1) and other side openings (3), each of said openings being provided so that a plastic or non-plastic container (4) is introduced into the unit (1) through one of said openings and discharged into an access duct (5);

a selection mechanism for eliminating non-plastic containers including a selecting-weighing device, a scale mechanism providing an impulse given in response to the dropping of a container through said access duct (5) and a container duct opening for discharging non-plastic containers which have a weight exceeding a value established in advance;

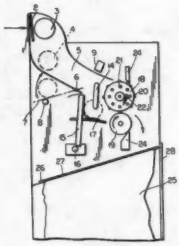
a folding door (7) hinged at hinge (6) to said duct opening, and means enabling a non-plastic container to be moved through said container duct opening for throwing down into a drawing seat;

first microswitch means (8) activated in response to said non-plastic container for emitting an alarm signal in response to said non-plastic container;

second microswitch means (9) responsive to a container of an accepted material, said second microswitch (9) being activated by a plastic container contacting said microswitch means (9) for counting the quantity of said plastic containers and activating a heating device to soften the plastic containers and for pressing;

feeding ducts (10), symmetrically fitted on the sides of a pressing assembly, said pressing assembly including fans (11) for sucking air previously heated by a resistance assembly (13) from grids (12) and insufflating it from counter-fitted openings (14) into the feeding duct on the container before pressing it;

at the end of the descent in the access channel (5), said plastic container (4) being pushed between pressing rollers by a singularizing-chocking device to avoid interferences between the object being pressed and the next following one;



said singularizing-chocking device comprising a swinging lever (15) driven by the motorization of the rollers through proper conveying with a swinging glyph, said lever (15) swinging around a second hinge (16) and employing a leaning shelf bracket (17);

said softened container passing between said pressing rollers, one of said pressing rollers being motor-driven roller (18) and the other of said pressing rollers (19) being a fixed inertia roller, said motor-driven roller (18) being fitted with proper press-soldering reliefs (20) which permits compacting the recovered part, said press-welding operation being performed because the roller (18) itself is heated by means of cuirassed candle shaped resistances (21) and tension supplied by sliding contacts (22) being applied to said candle shaped resistances;

a motor reducer (23) for starting said motor-driven roller (18);

knives (24) fitted on the periphery of the two rollers for detaching the recovered parts; and

a bag (25) into which the recovered parts are then discharged and extracted by means of binding pressing devices (26) of hanging supports (27) and taken away through a door opening (28).

4,884,387
VERTICAL FORM-FILL-SEAL METHOD AND APPARATUS

Robert C. James, Sheboygan, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

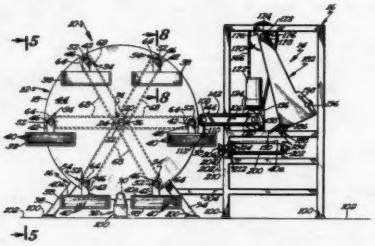
Filed Jun. 24, 1988, Ser. No. 210,872
Int. Cl.[4] B65B *9/20, 41/12, 41/16*
U.S. Cl. 53—451 **14 Claims**

1. The method of forming, filling and sealing packages wherein a web of flexible packaging material travels from a supply over means for forming it into tubing around a down-

wardly extending mandrel, and wherein the tubing is intermittently fed downwardly on the mandrel and off the lower end of the mandrel in package length increments by a reach of each of a plurality of endless belts extending downwardly on the outside of the mandrel, the method comprising:

guiding each belt for travel around upper and lower guide means in an endless path including said reach with said reach extending down from the upper to the lower guide means, with the upper and lower ends of said reach spaced from the outside of the mandrel a distance somewhat greater than the thickness of said material and thereby being somewhat spaced from the outside of the tubing on the mandrel, the guide means being held generally against horizontal displacement relative to the mandrel so that the spacing of the upper and lower ends of said reach from the outside of the tubing is maintained;

an intermediate portion of said reach between its said upper



and lower ends being displaceable generally without horizontally displacing said guide means from a retracted position wherein its face toward the mandrel is clear of the tubing to an extended position wherein its said face engages the tubing;

continuously driving each belt for continuous downward movement of its said reach; and

generally without horizontally displacing said upper and lower guide means, intermittently moving said intermediate portion of said reach of each belt from its said retracted position clear of the tubing toward the mandrel to an extended position engaging the tubing and holding it in engagement therewith for a fed interval so related to the linear movement of the belt as to feed a said package length increment of the tubing downwardly on the mandrel during that interval;

said intermediate portion of said reach returning to its said retracted position at the termination of said interval.

4,884,388

LETTUCE PACKER

Leon P. Ventura, Watsonville, and Javier Diaz-Infante, Salinas, both of Calif., assignors to Bud of California, Salinas, Calif.

Filed Feb. 24, 1988, Ser. No. 159,798
Int. Cl.[4] B65B *39/02, 5/08, 5/10, 67/00*
U.S. Cl. 53—537 **7 Claims**

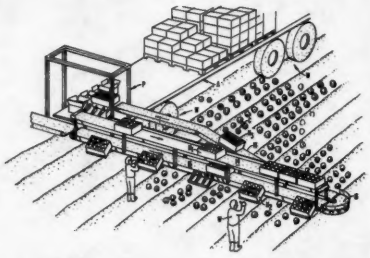
1. A lettuce head holding tray having a plurality of cells for receiving lettuce from a picker in a field, for transporting the lettuce from the picker to the packing station, and for permitting the packing of lettuce within a lettuce box, said trays for receiving rows and columns of lettuce at the top, holding said rows and columns of lettuce in side-by-side relation during transporting and permitting said rows and columns of lettuce to be removed through the bottom of said tray for packing to said lettuce box, said tray comprising:

a lattice defining the exterior perimeter of the cells for holding heads of lettuce in rows and columns, said lattice including,

first lattice members extending parallel to said columns on either side of said cells, and

second lattice members for extending parallel to said rows on either side of said rows, said first and second lattice members joined together to form said lattice;

cell side members, each said cell side member extending at least a portion of the width of said cell from one of said lattice members, said cell side members attached to said lattice member at the upper end and depending downwardly and inwardly of said cell from said upper end to said lower end;



means for elastically mounting said cell side members to said lattice member to permit elastic movement of said cell side members sides away from the center of said cell whereby heads of lettuce supported in said tray may be forced out the bottom of said cells;

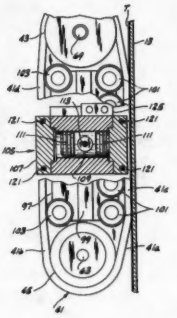
said cell side members of each said cell together defining a narrowing dimension to said cell, said dimension narrowing from the top of said cell to and towards the bottom of said cell whereby a head of lettuce freely received through said lattice at the top of said cell comes into supporting contact with the cell side members upon downward movement with respect to said cell.

4,884,389

ROTATING CAROUSEL AND BAG HANDLING APPARATUS FOR PAPER OR PLASTIC BAGS

Harold R. McGregor, 1444 Lincoln Ave., Owatonna, Minn. 55060

Filed Sep. 12, 1988, Ser. No. 242,545
Int. Cl.[4] B65B *43/18*
U.S. Cl. 53—571 **20 Claims**



1. A bag handling apparatus for transferring a bag from a tray containing a plurality of like bags to a predetermined position on a conveyor belt, said bag handling apparatus comprising:

a frame positionable generally proximate to both the tray and the conveyor belt;

a bag support assembly, said bag support assembly being mounted on said frame to move between a first support position displaced substantially over the conveyor belt and a second support position laterally displaced from said first support position relative to the conveyor belt;

a bag handling arm, said bag handling arm being mounted on said frame to move between a first position adjacent to the tray and a second position adjacent to said bag support assembly; and

gripping means connected to said bag handling arm and capable of gripping the bag when said bag handling arm is in said first position adjacent to the tray and responsively releasing the bag when said bag handling arm is in said second position adjacent to said bag support assembly such that the bag may be transferred to and generally supported on said bag support assembly when the bag is released by said gripping means,

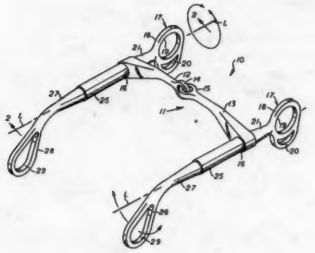
whereby the gripping means grips the bag in the tray when the bag handling arm moves to the first position adjacent to the tray, the bag handling arm then moves to the second position adjacent the bag support assembly while carrying the bag therewith, the gripping means releases the bag onto the bag support assembly responsive to the bag handling arm reaching the second position, and the bag support assembly moves to the second support position thereby placing the bag at a predetermined position on the conveyor belt.

4,884,390

BRIDLE BIT

Leo Benjak, 24 Barakee St., Marsden 4203 Queensland, Australia, and Ronald J. Myler, P.O. Boxz 143, Crockett, Tex. 75835

Filed May 19, 1988, Ser. No. 196,073
Int. Cl.[4] B68B *1/06*
U.S. Cl. 54—7 **11 Claims**



1. A bridle bit comprising

a mouthpiece member adapted to be received in the mouth of a horse and having laterally extending ends,

a head stall ring member mounted on the outer ends of said mouthpiece and extending rearwardly therefrom and mounted for rotation about their longitudinal axes on the outer ends of said mouthpiece member,

a curb chain slot in said head stall ring member,

a cheek piece member extending forwardly from each lateral end of said mouthpiece to reside closely adjacent the cheek of the horse and mounted for rotation about their longitudinal axes on the outer ends of said mouthpiece member,

a rein ring member mounted on each said cheek piece member and extending forwardly therefrom and mounted for rotation about the longitudinal axes forwardly of the lateral ends of said mouthpiece member, and

means supporting said heat still ring member and cheek piece member for rotation relative to each other and relative to said mouthpiece member,

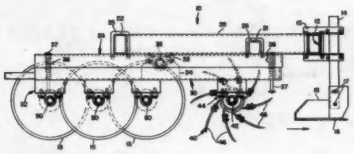
said head stall members and said rein ring members rotate relative to the outer ends of said mouthpiece member and to one another about their longitudinal axes.

4,884,391

STALK CUTTING APPARATUS

Keith J. Cosson, 416 N. Washington, Grand Island, Nebr. 68801

Filed Aug. 29, 1988, Ser. No. 237,978
Int. Cl.[4] A01D *45/00*
U.S. Cl. 56—53 **26 Claims**



1. Stalk cutting apparatus for towing behind a tractor for cutting corn stalks and other plant stems into short lengths, wherein said tractor includes a hitch; said apparatus comprising:

(a) a frame member adapted to be towed by said tractor; said frame member having leading and trailing ends; said frame member further comprising at least one wheel rotatably carried by said trailing end of said frame member; wherein said wheel is movable between raised and lowered positions;

(b) a rotatable cutter wheel carried by said frame; said cutter wheel comprising a plurality of cutting knives around the periphery thereof; wherein each said knife includes a cutting edge which is oriented transversely with respect to the longitudinal centerline of said apparatus;

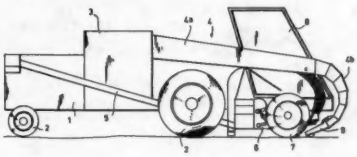
(c) a plurality of spaced-apart, vertically oriented rotatable coulters carried by said frame member; wherein said knives on said cutter wheel are adapted to cut stalks which are longitudinally oriented and said coulters are adapted to cut stalks which are transversely oriented with respect to the longitudinal centerline of the apparatus.

4,884,392

PROCESS AND MACHINE FOR COLLECTING OF PRODUCTS, ESPECIALLY FRUIT, FROM THE GROUND

Didier Czajkowski, Blagnac; Joël Labarthe, Rodez, and Bertrand Bouyou, Cahors, all of France, assignors to Conception, Elaboration, Realisation D'Ensembles Electroniques et Mecaniques (C.E.R.E.M.), Cahors, France

Filed Jul. 21, 1988, Ser. No. 222,030
Claims priority, application France, Jul. 21, 1987, 87 10435
Int. Cl.[4] A01D *46/00*
U.S. Cl. 56—13.1 **24 Claims**



1. A process for gathering products, especially fruit, from the ground comprising displacing a machine in a predetermined direction of travel along the ground, said machine including a chassis (6) having an inclined ramp coming into contact with the ground at a lower portion of said ramp and

forming an obtuse angle and an acute supplementary angle with the ground, and propelling the products toward said ramp by means of a flow of fluid directed toward said ramp,

directing the flow of fluid in a direction opposite to the direction of travel of the machine in such a manner that the products are located on the side of the obtuse angle of the inclined ramp,

articulating the inclined ramp in such a manner as to confer upon said ramp a displacing movement such that the lower portion may be displaced with respect to the chassis (6) along a trajectory of which the tangent forms with the ground an acute angle opening toward the rear with respect to the direction of travel of the machine.

4,884,393

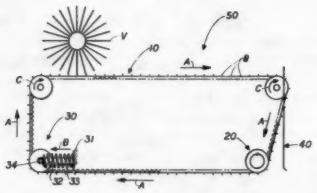
CONVEYOR SYSTEM FOR USE PARTICULARLY WITH HARVESTERS

Hakan K. Hilleby, 31 Palm Ave., Woodland, Calif. 95695

Filed Dec. 23, 1987, Ser. No. 136,958

Int. Cl.[4] A01D *46/00*

U.S. Cl. 56—327.1 **34 Claims**



1. In a harvester which picks up produce-laden vines and separates the vines from the produce,

wherein the harvester includes a vibrating tined wheel under which a first conveyor passes, said first conveyor carrying the vines and produce such that the vibrating wheel contacts the vines and dislodges the produce therefrom,

said first conveyor formed from: a plurality of flexible belts laterally spaced-apart sufficiently to let produce pass there between,

each belt having an outer surface formed with a plurality of outwardly extending fingers along the belt's length to capture the vines thereon,

each belt having an inner surface formed with a belt driving means configured as a series of merlons and crenels which each extend uninterrupted along the belt's entire width,

drive means contacting said belt's merlons and crenels to move all said belts in synchrony and said drive means defining a preclusion means to prevent build up of debris such as vines, produce, dirt or other field contaminants between said drive means and said belts.

4,884,394

FRICTION SPINNING UNIT AND METHOD OF OPERATING SAME

John G. Campbell, Greenville, S.C., and Allan Thompson, Rochdale, England, assignors to Hollingsworth U.K. Ltd., Accrington, England

Filed Feb. 29, 1988, Ser. No. 161,803

Claims priority, application United Kingdom, Mar. 13, 1987, 8706033; Oct. 5, 1987, 8723336

Int. Cl.[4] D01H *13/16*

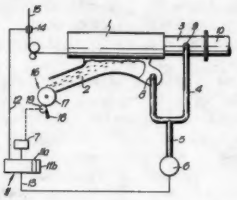
U.S. Cl. 57—264 **20 Claims**

1. A friction spinning unit including:

(a) foraminous friction means having a foraminous surface;

(b) means for feeding separated fibres to the foraminous friction surface means to roll up to form spun yarn in operation of the friction spinning unit;

(c) suction applying means having a first suction line to apply suction from within said foraminous friction means to said foraminous surface to hold the fed fibres thereon; a second suction line to said suction applying means to apply suction from outside said foraminous friction means to said foraminous surface; and



(d) suction switch means responsive to the suction prevailing in said second suction line and operative to discontinue operation of the friction spinning unit when the suction sensed by the suction switch deviates from a predetermined range of values.

4,884,395

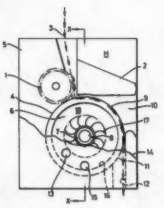
FIBRE OPENING DEVICES

John J. Stamp, Simpsonville, S.C., assignor to Wm. R. Stewart & Sons (Hacklemakers) Ltd., England

Filed Jun. 22, 1988, Ser. No. 209,729

Int. Cl.[4] D01H *7/892, 7/895*

U.S. Cl. 57—301 **11 Claims**



1. A fibre opening device for use with a discontinuous spinning process comprising a housing in which an opening roller is rotatably mounted, the housing having a trash separation zone and a fibre stripping zone, wherein the roller has a cylindrical wall defining a working surface from which combing elements project, the roller being substantially hollow, and wherein holes are provided in the cylindrical wall of the opening roller to permit a flow of air through the surface of the roller to the hollow interior thereof, and including cleaning means consisting of a vacuum suction device and a compressed air jet device for removing the accumulated dust, trash and short fibre from the interior of the opening roller.

4,884,396

DESULFURIZING AGENT AND PROCESS FOR TREATING HYDROGEN SULFIDE CONTAINING GAS, COAL GASIFICATION SYSTEM AND POWER GENERATION SYSTEM BASED ON COAL GASIFICATION USING THE DESULFURIZING AGENT

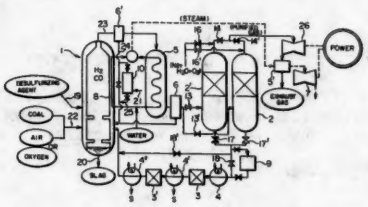
Tomohiko Miyamoto, Takahagi; Shuntaro Koyama, Katsuta; Jinichi Tomuro, Katsuta; Atsushi Morihara, Katsuta; Hisao Yamashita; Sadao Takahashi, both of Hitachi; Eiji Kida, Hiroshima; Akio Ueda, Kure, and Shigehito Takamoto, Hiroshima, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 155,814

Claims priority, application Japan, Feb. 16, 1987, 62-31473; Jul. 21, 1987, 62-181943

Int. Cl.[4] F02C *3/28*

U.S. Cl. 60—39.12 14 Claims



1. A coal gasification system, comprising: a gasification furnace for forming a reducing combustion gas from fine coal powder by means of an oxidizing agent; at least two desulfurization columns, each having a desulfurizing agent for adsorbing hydrogen sulfide contained in the reducing combustion gas, thereby forming a purified reducing combustion gas when functioning in a desulfurization mode; means for supplying the reducing combustion gas from the gasification furnace to a desulfurization column functioning in the desulfurization mode; means for supplying an oxidizing agent to another desulfuriztion column functioning in a regeneration mode, and for regenerating the desulfurizing agent having the hydrogen sulfide adsorbed thereon, thereby forming a regenerated gas containing hydrogen sulfide and sulfur dioxide; and means for controlling the flow of gases to said at least two desulfurization columns wherein at least one desulfurization column functions in the desulfurization mode and at least one desulfurization column functions in the regeneration mode during continuous operation; a Claus reaction column for subjecting the hydrogen sulfide and sulfur dioxide in the regenerated gas to Claus reaction in the presence of a catalyst, thereby forming elemental sulfur; means for supplying the regenerated gas directly to the Claus reaction column from a desulfurization column functioning in the regeneration mode; and a means for returning an effluent gas from the Claus reaction column to the gasification furnace after removal of the elemental sulfur from the effluent gas.

4,884,397

CONTROL SYSTEM TOPPING LOOP

Richard F. LaPrad, South Windsor, and Gary C. Horan, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 188,590, Apr. 26, 1988, Pat. No. 4,845,943. This application Jan. 23, 1989, Ser. No. 300,396

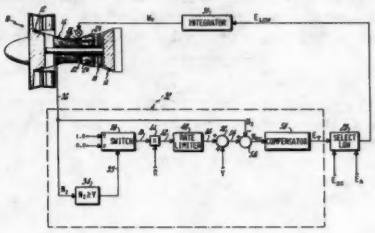
Int. Cl.[4] F02C *9/00*

U.S. Cl. 60—39.24 6 Claims

1. A control system for apparatus, said apparatus having means for continuously determining the actual value of a first parameter, wherein the actual value of said parameter is not to exceed a specified steady state redline limit during operation of the apparatus, said control system comprising a topping loop including:

means for continuously determining the difference between the actual value of said first parameter and a transient limit for said parameter and for generating a first error term having a value indicative of said difference;

means for maintaining the transient limit at a constant value



which is below the steady state redline limit until said parameter value exceeds said constant value; and

means for (i) increasing the transient limit at a selected rate up to a maximum value equal to the steady state limit upon said parameter value increasing to said constant value and, (ii) decreasing the transient limit at a selected rate to no less than said constant value upon said first parameter value decreasing to below said constant value.

4,884,398

METHOD OF AND APPARATUS FOR REDUCING ENGINE SMOKE EMISSIONS

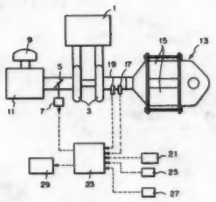
Izuru Morita; Keisuke Kishitani, both of Tokyo; Masayoshi Kajitani, Kanagawa; Shoji Tozawa, Akashi; Masanori Satoh, Sagamihara; Kisaburo Otabe, Isehara, and Mamoru Onda, Sagamihara, all of Japan, assignors to Shin Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 217,418

Claims priority, application Japan, Oct. 19, 1987, 62-263589; Oct. 19, 1987, 62-263590

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—274 10 Claims



1. A method of reducing smoke emitted from a diesel engine, comprising: disposing a trap for trapping black smoke particles in an exhaust system of said engine, said trap including a ceramic trap assembly having a honeycomb structure in which a catalyst which enables lowering of the combustion temperature of black smoke is carried on internal passage walls; providing a pressure sensor at the inlet of said trap; and controlling the combustion rate of black smoke particles in said trap in such a manner that a specified exhaust pressure range in said trap is obtained on the basis of an engine speed signal from an engine speed sensor, a value representing the exhaust pressure supplied by said pressure sensor is compared with said specified exhaust pressure range, and when the exhaust pressure

inside said trap exceeds the higher-limit value of said specified exhaust pressure range, a butterfly valve in an intake system of said engine is throttled, whereas when the exhaust pressure is equal to or less than the lower-limit value of said specified exhaust pressure range, said butterfly valve is fully opened, wherein the control of the degree of opening of said butterfly valve is alternatively conducted in either one of the automatic and manual regeneration modes such that, in said automatic regeneration mode, said butterfly valve is lightly throttled, whereas in said manual regeneration mode, said butterfly valve is throttled to a greater degree than in the automatic mode.

4,884,399

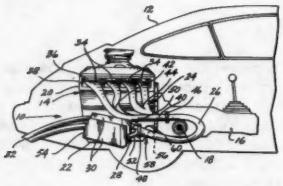
EXHAUST SYSTEM FOR REAR-ENGINE VEHICLES

James K. Morris, 7004 S. 12th, #2106, Tacoma, Wash. 98465

Filed Feb. 24, 1989, Ser. No. 315,397

Int. Cl.[4] F01N 7/10

U.S. Cl. 60—313 **9 Claims**



1. A low-restriction exhaust system for a rear-engine automobile having a rearward facing engine coupled to a transaxle, the exhaust system comprising:

(a) at least one exhaust manifold adapted to be mounted on the engine and configured to direct engine exhaust gases toward the front of the automobile;

(b) at least one exhaust pipe coupled at one end to said at least one exhaust manifold, said at least one exhaust pipe extending in a forward direction over said transaxle to curve around said transaxle and extend in a rearward direction; and

(c) at least one muffler coupled to the other end of each of said one or more exhaust pipe for silencing exhaust noises.

4,884,400

EXHAUST MANIFOLD OF INTERNAL COMBUSTION ENGINE

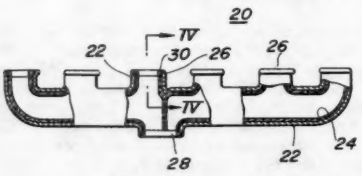
Yoshimasa Tanaka, Ayase, and Yutaka Tasaki, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Continuation of Ser. No. 801,696, Nov. 25, 1985, abandoned. This application Mar. 11, 1988, Ser. No. 167,086

Claims priority, application Japan, Nov. 29, 1984, 59-1881230[U]; Nov. 29, 1984, 59-181231[U]

Int. Cl.[4] F01N 7/10

U.S. Cl. 60—323 **3 Claims**



1. An exhaust manifold for conducting heated exhaust gas from an internal combustion engine and including at least one inlet or outlet port, comprising:

an outer body of aluminum having a configuration which corresponds to that of the exhaust manifold;

a heat resisting steel layer disposed on the inner surface of said outer body at said inlet or outlet port; and

an insulating layer of ceramic fiber disposed on the inner surface of said outer body not covered by said heat resisting steel layer, said insulating layer protecting said outer body from the heated exhaust gas and said heat resisting steel layer maintaining the disposition and configuration of said insulating layer on the outer body.

4,884,401

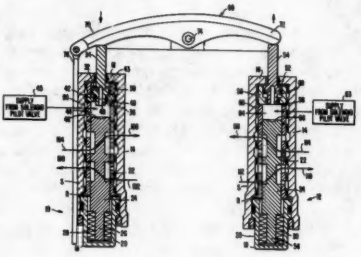
THREE POSITION DUAL FAILURE SHUT-OFF VALVE SYSTEM

Jeffrey D. Metcalf, Albion, and Brent A. Klopfenstein, Rockford, both of Ill., assignors to Sundstrand Corp., Rockford, Ill.

Filed Aug. 30, 1988, Ser. No. 238,097

Int. Cl.[4] F16D 31/02

U.S. Cl. 60—403 **11 Claims**



1. A shut off valve system connected to a pair of hydraulic motors geared together to drive a single output shaft by either or both of said motors comprising;

means for connecting supply hydraulic fluid to and return hydraulic fluid from each motor including first and second valves in first and second cylindrical housings with a spool and a pilot piston in axial alignment and arranged for independent axial movement within each housing;

first means for supplying hydraulic pressure to the pilot piston in said first cylindrical housing;

second means for supplying hydraulic pressure to the pilot piston in said second cylindrical housing;

means for removing hydraulic pressure from the pilot piston in the valve associated with one of said motors for disconnecting the supply hydraulic fluid to said motor while connecting return hydraulic fluid to an inlet of said motor through a path including the spool of said valve to permit recirculation of fluid at a first rate sufficient to avoid excessive drag on the other hydraulic motor; and

means for removing hydraulic operating pressure to the pilot pistons in both of said valves for disconnecting the supply hydraulic fluid to each of said motors while connecting return hydraulic fluid from each motor to its inlet through a path including the respective spool for each of said valves to permit recirculation of fluid at a second rate which is lower than said first rate to provide damping of both motors.

4,884,402
CONTROL AND REGULATING DEVICE FOR A HYDROSTATIC DRIVE ASSEMBLY AND METHOD OF OPERATING SAME

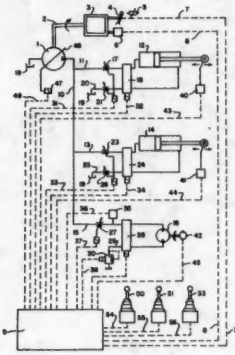
Hilmar Strenzke, Aschaffenburg, and Norbert Fehn, Elsenfeld, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 190,720

Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716200

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—426 **7 Claims**



1. An improved hydrostatic assembly including a control and regulating device therefore of the type having an adjustable pump (1) including an adjustable element (47) and driven by a primary energy source (3), a plurality consumers (12, 14, 16) each operably connected to said adjustable pump by a consumer connection branch line (11, 13, 15) for movement in two opposite directions of movement, a plurality of direction-reversing valves (18, 24, 28) one connected to each consumer by one of said consumer connecting branch lines, a plurality of electromagnetic throttle valves (17, 23, 27) one provided in each of the consumer connection branch lines, an electronic control (9) electrically connected to said electromagnetic throttle valves, a plurality of speed setpoint adjusters (50, 51, 53) one electrically connected to the electronic control for each consumer, and a plurality of actual speed value pickups (40, 41, 42) one connected to the electronic control are provided for each consumer, wherein the improvement comprising:

(a) at least one of the consumers (16) having a rotating shaft and being operable in a braking state; and

(b) an electric pressure switch (35) for transmitting a pressure signal, said electric pressure switch electrically connected to the electronic control (9) and connected to the consumer connection line (15) for said at least one consumer (16) between the throttle valve (27) assigned to said at least one consumer (16) and said at least one consumer (16).

4,884,403
MODULAR BRAKE ACTUATOR

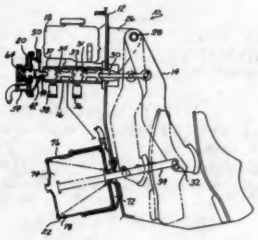
James L. Weber, W. Bloomfield, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Jul. 21, 1988, Ser. No. 222,462

Int. Cl.[4] B60T *13/00*

U.S. Cl. 60—547.1 **12 Claims**

1. A modular brake actuator comprising a mounting base having first and second surfaces on opposite sides thereof, a brake pedal pivotally mounted to one surface of the mounting base for movement from a rest position to brake application positions, a master cylinder mounted to the other surface of the mounting base and first actuating means operatively connected between the brake pedal and the master cylinder for operating the master cylinder in response to the brake pedal, booster means also mounted on the other surface of the mounting base and second actuating means operatively connected between the booster means and the brake pedal for transmitting a force



from the booster means to the brake pedal that assists movement of the brake pedal from the rest position to a brake application position, controller means between the master cylinder and the booster means, said controller means being responsive to the operation of the master cylinder for operating the booster means and developing the assisting force.

4,884,404
MASTER CYLINDER ASSEMBLY

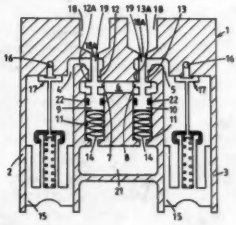
Brian M. Colgate, Gloucestershire, Great Britain, assignor to Lucas Industries Public Limited Company, Birmingham, United Kingdom

Filed Apr. 26, 1988, Ser. No. 186,141

Claims priority, application United Kingdom, Apr. 30, 1987, 8710273

Int. Cl.[4] F15B *7/00*

U.S. Cl. 60—581 **20 Claims**



1. A master cylinder assembly comprising;

a plurality of pressure cylinders;

a transfer passage extending between said cylinders;

a plurality of valve members operable in response to actuating pressure produced in the cylinders for controlling fluid flow through said transfer passage and being urged towards first positions for interrupting communication between said transfer passage and said cylinders, respectively, so that when said cylinders are pressurized simultaneously said valve members are simultaneously displaced by said actuating pressure to second positions for placing said cylinders in communication with each other via said transfer passage, and when only one cylinder is pressurized only one of said valve members is displaced for placing only said one cylinder in communication with said transfer passage;

pressure fluid outlets for said cylinders; and

each valve member being associated with a respective pressure fluid outlet for closing said pressure fluid outlets when said valve members are in said first positions, and for opening a respective associated pressure fluid outlet when each valve member moves towards said second position to permit expulsion of fluid under pressure therethrough from an associated cylinder.

4,884,405

VALVE ARRANGEMENT FOR A PISTON CHARGER DRIVEN BY EXHAUST GAS PULSES

Oskar Schatz, Waldpromenade 16, D-8035 Gauting, Fed. Rep. of Germany

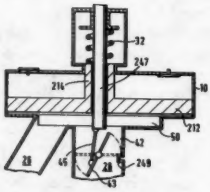
PCT No. PCT/DE87/00330, § 371 Date Mar. 22, 1988, § 102(e) Date Mar. 22, 1988, PCT Pub. No. WO88/00645, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 22, 1987, Ser. No. 171,008

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1986, 3625050

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—605.1 **3 Claims**



1. A method for the operation of a controllable valve means at the exhaust gas outlet of a piston charger adapted to be driven by the exhaust gas pulses of an IC engine, said piston charger having at least one expansion space cavity delimited by a moving working piston, charging air portion of said cavity provided with at least one charging air inlet and at least one charging air outlet connected to the engine air intake, the limit of the expansion space cavity opposite to the working piston being provided with at least one exhaust gas inlet and at least one exhaust gas outlet, said controlled valve means directly coupled with said piston and associated with said exhaust gas outlet, said method comprising the steps of:

exhausting gas from the internal combustion engine into the expansion space of the charger cavity;

moving said piston in said expansion space with said exhaust gas;

preventing exhaust gas from exiting said expansion space cavity with said control valve means until said piston has moved a desired distance in said expansion space;

compressing charging air in the charging portion of the charger cavity;

opening said exhaust outlet with said controllable valve means; and

enabling the exhaust gas to exit said exhaust gas outlet.

4,884,406

TURBOCHARGER

Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Aug. 12, 1988, Ser. No. 231,690

Claims priority, application Japan, Aug. 17, 1987, 62-203142

Int. Cl.[4] F02B *37/00*; F02C *7/06*

U.S. Cl. 60—605.3 **11 Claims**

1. A turbocharger comprising:

a turbine equipped with a turbine blade connected to an exhaust pipe of an engine and driven by exhaust gas energy of said engine;

a compressor equipped with an impeller connected to an intake pipe of said engine and supercharges intake air into said engine when driven by said turbine;

a shaft having said turbine blade fixed at one of the ends thereof and said impeller fixed at the other end thereof;

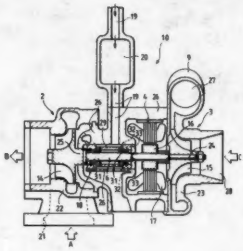
a housing supporting rotatably said shaft through bearings;

an A.C. generator-motor equipped with a magnetic rotor fixed to said shaft and with a stator coil fitted to said housing, and operated either as a motor or as a generator;

a battery connected to said A. C. generator-motor;

temperature detection means for detecting the temperature of said turbine;

an oil reservoir connected to said bearing above said bearing for supporting said shaft; and



control means for supplying the power from said battery to said A.C. generator-motor and operating said A.C. generator-motor as the motor when a temperature signal from said temperature detection means is above a predetermined set temperature after the stop of said engine, and for opening said oil reservoir to cause the natural drop of a lubricating oil staying in said oil reservoir to lubricate said bearing, and for closing said oil reservoir to restore an ordinary lubricatable state either when the temperature signal from said temperature detection means is below the predetermined set temperature or when the engine is driven.

4,884,407

TURBO COMPOUND ENGINE

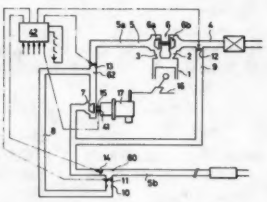
Kazuhiro Hatanaka, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 262,404

Claims priority, application Japan, Oct. 28, 1987, 62-270322

Int. Cl.[4] F02G *5/00*

U.S. Cl. 60—614 **11 Claims**



1. A turbo compound engine comprising:

an engine having an intake air passage, an exhaust gas passage and a crankshaft;

a power turbine disposed in the exhaust gas passage so as to be rotatable in normal and reverse senses;

a reversing mechanism for connecting the power turbine

with the crankshaft in a manner such that the power turbine and the crankshaft may rotate in the same direction or the opposite direction in accordance with switching thereof;

an exhaust bypass line connected to the exhaust gas line at two junctions so as to bypass the power turbine;

first and second shut-off valves respectively disposed in the exhaust gas line upstream of said two junctions of the exhaust bypass line and the exhaust gas passage, so that they may be closed upon reversed switching of the reversing mechanism;

an intake air bypass line connected to the intake air passage at one end thereof and to the exhaust gas passage downstream of the power turbine and upstream of one of the junctions with the exhaust bypass line at the other end;

a third shut-off valve disposed in the intake air bypass line; and,

control means for detecting the rotation of the power turbine, and for opening the third shut-off valve when the control means detects that the rotation of the power turbine is reversed and reaches a predetermined value.

4,884,408

METHOD OF CONTROLLING A COMBUSTION PROCESS YIELDING WATER VAPOR

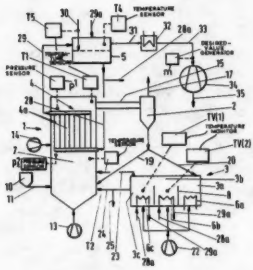
Alfred Karbach, Bad Vilbel; Georg Schaub, Frankfurt am Main, and Rolf Peters, Neu-Anspach, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 9, 1989, Ser. No. 295,261

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800863

Int. Cl.[4] F01K *13/02*

U.S. Cl. 60—667 **3 Claims**



1. A method of operating a combustion plant which comprises the steps of:

effecting combustion of a fine-grain dustlike solid fuel with air in a combustion zone of a circulating fluidized bed;

effecting heat exchange with said circulating fluidized bed in an upper end of said zone;

accumulating water vapor from said heat exchanger;

driving a turbine with water vapor from said accumulator;

continuously calculating the rate at which water vapor is produced in said heat exchanger and automatically comparing the calculated rate at which water vapor is produced with a setpoint rate at which water vapor is required by said turbine; and

adjusting rates at which said fuel and air are fed to said combustion zone in accordance with the comparison of the rate at which water vapor is produced in the heat exchanger with said setpoint rate.

4,884,409

METHOD AND APPARATUS OF COOLING A TOROIDAL RING MAGNET

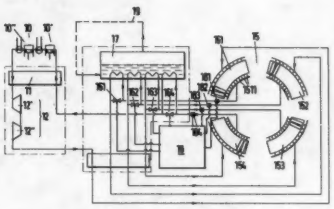
Hans Quack, Pfaffikon, Switzerland, and Antonio Angelini, Ranco, Italy, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 25, 1989, Ser. No. 301,631

Claims priority, application Switzerland, Feb. 12, 1988, 507/88

Int. Cl.[4] F25B *19/00*

U.S. Cl. 62—51.1 **16 Claims**



2. A method of cooling a toroidal ring magnet comprising the steps of

cooling a flow of a gaseous cooling medium;

passing the cooled gaseous cooling medium in a first path into heat exchange relation with the magnet to cool the magnet;

passing the gaseous cooling medium from the magnet into heat exchange relation with a second cooling medium to cool the gaseous cooling medium;

thereafter passing the gaseous cooling medium in a second path into heat exchange relation with the gaseous cooling medium in said first path to cool the medium in said second path while heating the medium in said first path;

passing the medium in said second path into heat exchange relation with the magnet to cool the magnet; and

thereafter recycling the cooling medium.

4,884,410

PURGE/CHARGE MANIFOLD AND METHOD FOR CRYOGENIC SYSTEMS

Steven H. Bell, Leominster; Mark A. Stira, Wilmington, and James Blotzer, Winthrop, all of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Filed Aug. 22, 1988, Ser. No. 234,913

Int. Cl.[4] G25B *45/00*

U.S. Cl. 62—77 **22 Claims**

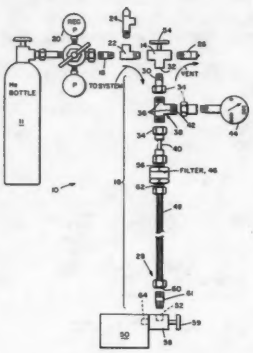
8. A device for providing within a cryogenic system an increased level of concentration of a working gas, the working gas being supplied from a remote source, the device comprising:

a T-shaped manifold having a cross bar and a main section intersecting perpendicularly with the crossbar; one end of the cross bar being associated with the source, an opposite end of the cross bar connected to a purge valve, a crossbar end of the main section being at the intersection of the cross bar and main section, and a port end of the main section opposite the crossbar end of the main section being associated with the system;

a multiway valve positioned at the intersection of the cross bar and the cross bar end of the main section, the multiway valve at one setting allowing the working gas to flow from the source through the one end of the cross bar, through the main section, to the port end and into the system, and at a second setting allowing gas within the system to be vented out of the system through the main section, to the opposite end of the cross bar and out the purge valve;

the multiway valve being repeatedly changeable between

the one and second settings to alternately charge the system with the working gas and purge the system of gas respectively such that an increased level of concentration of the working gas is provided within the system; and



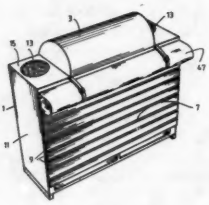
an o-ring fitting attached to the port end of the main section, the VCO fitting coupling the manifold to the system.

4,884,411

HIGH HUMIDITY REFRIGERATION APPARATUS

Graeme B. Wallace, Bayswater, and Glenn R. Adams, Seaford, both of Australia, assignors to Co-Ordinated Thermal Systems Pty. Ltd., Victoria, Australia

Filed May 12, 1988, Ser. No. 193,378
Int. Cl.[4] F25D *17/06*
U.S. Cl. 62—91 **6 Claims**



1. A high humidity refrigeration apparatus comprising a heat exchanger casing containing air humidifying and cooling means, said air humidifying and cooling means comprising uppermost water spray nozzle means, a cooling heat exchanger mounted underneath said water spray nozzle means for cooling water sprayed from said nozzle means, and a heat exchanger mounted underneath said cooling heat exchanger for humidifying air with water which has been cooled by said cooling heat exchanger,

an air inlet at the top of said heat exchanger casing for directing air to be humidified and cooled to the bottom of said heat exchanger casing where it can pass upwardly therethrough past said air humidifying and cooling means and into an outlet chamber connected with said heat exchanger chamber, said outlet chamber having a forward upright face with air outlet means therein through which air passing through said high humidity refrigeration apparatus can exit.

4. A method of removing heat from goods, such as vegetables, and for maintaining said goods cooled and in humidified air comprising:

(a) providing cooled and humidified air;

(b) loading goods to be maintained cooled and humidified in an elongate horizontally extending chamber in groups, a first group being at one end of said chamber, a second group being horizontally displaced from but next to the first group;

(c) passing the cooled and humidified air in step (a) through the first group and then through the second group; and

(d) allowing the air which has passed through the second group to pass over the top of said goods to then be cooled and humidified and returned to step (c);

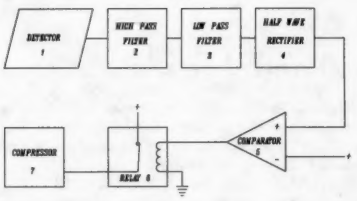
whereby heat can be removed from the goods and the goods can be maintained cooled and in humidified air.

4,884,412

COMPRESSOR SLUGGING PROTECTION DEVICE AND METHOD THEREFOR

William Sellers, P.O. Box 3453, Boise, Id. 83703, and Terry Garrison, 2700 Claremont Dr., Fort Collins, Colo. 80526

Filed Sep. 15, 1988, Ser. No. 244,306
Int. Cl.[4] F04B *23/04*
U.S. Cl. 62—115 **22 Claims**



1. A method for preventing damage to a compressor due to slugging which comprises the steps of:

electrically detecting vibrations due to a slugging compressor;

converting said vibrations into corresponding electrical signals;

limiting the frequency band of said electrical signals to a predetermined pass band;

rectifying and filtering said pass band to produce a direct current electrical signal which is proportional to the energy of the signal in said pass band;

comparing said direct current signal to a reference signal which corresponds to the energy of the pass band of a normally operating compressor to identify slugging vibrations; and

disabiling said compressor responsive to said slugging vibration detection.

4,884,413

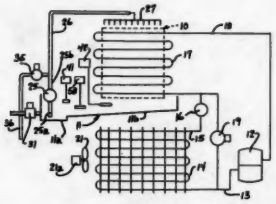
ICE MACHINE

James A. Quandt, Rockford, Ill., and Joseph M. Lee, Houston, Tex., assignors to Specialty Equipment Companies, Inc., Rockton, Ill.

Filed Mar. 13, 1989, Ser. No. 322,510
Int. Cl.[4] F25C *1/00*
U.S. Cl. 62—135 **20 Claims**

1. In an ice making machine having an ice mold means, refrigeration means operable in an ice making mode for refrigerating the ice mold means and operable in a harvest mode for heating the ice mold means, a water receiver, water inlet valve means for controlling flow of water from a water supply to the water receiver, first water control means for operating the water inlet valve means to provide an initial quantity of water in the water receiver, water circulation means including a pump operable to withdraw water from the receiver and circulate the water over the ice mold means and return unfrozen water from the ice mold means to the receiver, circuit means

for operating the refrigeration means in the ice making mode to refrigerate the ice mold means and for operating the pump to circulate water over the ice mold means for cooling and freezing thereon during an ice making cycle, circuit means for ending the ice making cycle and for operating the refrigeration means in the ice harvest mode and for stopping the pump during an ice harvest cycle, the improvement comprising,



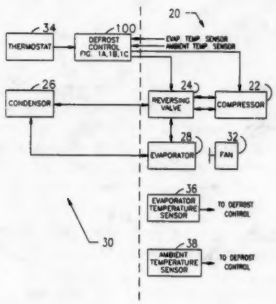
temperature sensing means for sensing the temperature of the water in the water receiver, second water control means responsive to said temperature sensing means and operative during each ice making cycle when the water temperature in the receiver initially decreases to about water freezing temperature for opening and thereafter closing water inlet valve means to supply additional water to the receiver.

4,884,414

ADAPTIVE DEFROST SYSTEM

Peter J. Bos, Manitowoc, Wis., assignor to Paragon Electric Company, Inc., Two Rivers, Wis.

Filed Aug. 26, 1987, Ser. No. 89,662
Int. Cl.[4] F25D *21/06*
U.S. Cl. 62—156 **36 Claims**



1. A method for controlling the defrosting of a heat transfer unit of a temperature conditioning system by initiating a defrost operation when a predetermined amount of frost has accumulated on the unit during a frost accumulation period that occurs between defrost operations, said method being of the type comprising the steps:

determining the time required to actually defrost said unit during an actual defrost operation;

increasing the frost accumulation period before initiating the next defrost operation if the time to complete the last defrost was less than said desired defrost time period; or

decreasing the frost accumulation period before initiating the next defrost operation if the time to complete the last defrost was greater than said desired defrost time period;

improved wherein said determining the time to actually defrost said unit comprises the step of

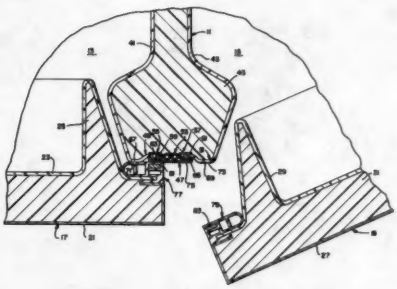
determining the time period required to raise the temperature of said heat transfer unit from a first predetermined temperature to a second predetermined temperature.

4,884,415

HEAT TRANSFER BARRIER FOR THE YODER LOOP OF A REFRIGERATOR CABINET

Sheldon W. Mandel, and Chinmoy Banerjee, both of Galesburg, Ill., assignors to Maytag Corporation, Newton, Iowa

Filed Sep. 29, 1988, Ser. No. 250,605
Int. Cl.[4] F25B *47/00*
U.S. Cl. 62—277 **4 Claims**



1. A heat transfer barrier for the interior storage space of a refrigerated compartment formed by a plastic liner provided with an access opening having a peripheral surface engageable by a corresponding gasket of a compartment door, the peripheral surface of the access opening being defined by an outwardly extending plastic flange of the plastic liner and an inwardly directed external metal flange provided with a longitudinal slot, a longitudinal edge of the plastic flange being disposed within the longitudinal slot, and a yoder loop tube adjacent the metal flange for heating same, the improvement comprising the longitudinal edge of the plastic flange being inwardly offset to define an outwardly extending rib having an external surface disposed in a substantially coplanar relationship with and adjacent to a corresponding external- surface of the metal flange, the external surfaces of the rib and metal flange collectively defining a flat sealing surface extending around the periphery of the access opening for engagement by the door gasket to form a barrier against the transfer of heat from the metal flange to the interior storage space when the door is in a closed position.

4,884,416

ELECTRONIC AIR-CLEANING AIR CONDITIONER AUTOMATICALLY WASHED BY WATER

Min-Su Hwang, P.O. Box 10160, Taipei, Taiwan

Filed Dec. 29, 1988, Ser. No. 291,666
Int. Cl.[4] F28G *9/00*
U.S. Cl. 62—303 **7 Claims**

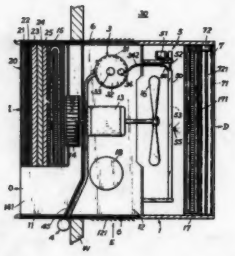
1. An air-cleaning air conditioner comprising:

an inside air cleaning means provided in a front portion of an air conditioner set located inside a room or an interior for cleaning air inside the room or interior circulated through an evaporator of the air conditioner set; and

an outside air dust-removing means provided in a rear portion of the conditioner set located in an outdoor for precluding dust entrance into the rear portion of the conditioner set;

said inside air cleaning means including a screen formed on a front portion of the air conditioner set for primarily filtering coarse dust particles laden in the air, a non-woven cloth filter formed on a rear side of the screen for filtering fine dust particles, an electrostatic precipitator formed on a rear side of the cloth filter for precipitating finest parti-

cles, an oxygen ion producer secured to a rear side of the electrostatic precipitator for producing oxygen anions for human health and for cleaning air, and an activated-carbon filter formed on a rear side of the oxygen ion producer beyond the evaporator for deoderizing a dust-removed air or hazardous gases flowing into the evaporator; and said outside air dust-removing means including a water accumulator collecting a condensate water from a bottom plate of the conditioner set, a detergent supplier supplying quantitative detergent into the water accumulator for



mixing the condensate water in said accumulator, a water spraying means connected to said water accumulator and reciprocatively spraying water onto the condenser for cleaning the condenser, a side filter means having two filters detachably formed on two louver-windows on two side portion of the conditioner set for precluding dust laden in outdoor air into the rear portion of the conditioner set, and a rear rolling shield rotatably wound on a spindle driven by a rear motor for extensibly closing a rear discharge port of the conditioner set for precluding the entrance of air pollutants therein.

4,884,417

NEEDLE SELECTION DEVICE IN KNITTING, SOCK- AND STOCKING-MAKING MACHINES AND THE LIKE

Riccardo Tenconi, Varese, Italy, assignor to MEC-MOR S.P.A., Olona Va, Italy

Filed Feb. 29, 1988, Ser. No. 162,395

Claims priority, application Italy, Mar. 4, 1987, 19580 A/87

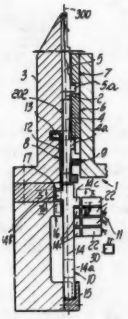
Int. Cl.[4] D04B *15/18*

U.S. Cl. 66—220 **7 Claims**

1. In a knitting machine comprising a machine needle bed having at least one groove defining a groove bottom, a needle selection device comprising: at least one selector accommodated in said groove and acting on a needle accommodated in said groove above said selector, said selector having, on a side thereof facing away from said groove bottom, at least one heel engageable with selection cams facing said needle bed and defining at least two paths which can be selectively followed by said heel during a movement of said selection cams relatively to said needle bed, said selector being controllably moveable from an extraction position, in which said heel protrudes from said groove to engage with said selection cams, to a sunk position, in which said heel is completely accommodated in said groove so as to not interfere with said selection cams; an elastic element accommodated in said groove and acting on said selector for holding said selector in said extraction position; at least one sinking cam rigid with said selection cams and acting on said selector to push said selector in said sunk position; engagement means supported by said needle bed and engageable with said elastic element with said selector in a sunk position for holding said selector in said sunk position; actuator means rigid with said selection cams, sdid actuator means being controllably activatable for disengaging said engagement means from said elastic element and allowing said selector to return into said extraction position,

wherein said needle bed defines a needle cylinder, and

wherein said engagement means comprises a rod, said rod



being controlled by said actuator means for elastically flexing in a plane substantially tangent to the needle cylinder thereby moving an upper end of said rod from an operative position in engagement with said elastic element to an inoperative position away from said elastic element.

4,884,418

INSTALLATION FOR THE WET TREATMENT OF TEXTILE MATERIALS DISPOSED ON MATERIAL CARRIERS

Bernard Barriquand; Francois Villard, and Bernard Durantet, all of Roanne, France, assignors to Barriquand, Roanne, France

Filed Dec. 28, 1987, Ser. No. 138,716

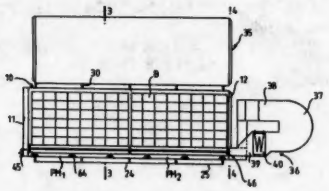
Claims priority, application France, Dec. 30, 1986, 86 18338; Jan. 22, 1987, 87 00733; Mar. 12, 1987, 87 03382

Int. Cl.[4] D06B *5/16*

U.S. Cl. 68—150 **23 Claims**

1. An installation for the wet treatment of textile materials disposed on material-carriers, comprising a tank with a substantially horizontal axis defined by a floor, a ceiling and interconnecting sidewalls, said tank having at least one end provided with a door for inserting and removing at least one material-carrier on which the textile materials to be treated are loaded, means for causing a treatment fluid to flow in a closed loop through said textile materials along either a first or second direction, said fluid flow means further including means for bringing the treatment fluid to the desired temperature and at least first and second pipes, said at least one material-carrier including a box shaped base having at least one aperture for

connection to said first pipe of said fluid flow means, said box shaped base opening into said textile material so as to form a first flow path of the treatment fluid in one direction, the flow of said treatment fluid in the other direction following a second path which includes at least said second pipe of said fluid flow



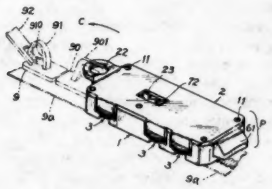
means, said second pipe opening into a treatment volume defined by the interior of said tank and said textile material, wherein said first and second paths pass through said treatment volume through one or more passages formed in the vicinity of the floor of the tank.

4,884,419

INTERLOCKABLE LOCK

Chong-Kuan Ling, Taipei, Taiwan, assignor to Sinox Company, Ltd., Taipei, Taiwan

Filed Dec. 29, 1988, Ser. No. 291,664
Int. Cl.[4] E05B *65/68*
U.S. Cl. 70—4 **12 Claims**



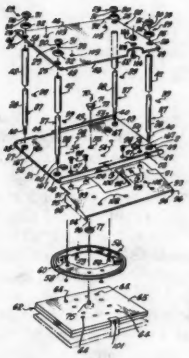
1. An interlockable lock comprising:
a lock body pivotally secured to a first slider of a zipper fastener and having a latch operatively engageable with an eyelet formed in a second slider of the zipper fastener for locking the lock body on the second slider for closing two sliders of the zipper fastener, the lock body comprising:
a first cover generally formed as a rectangular shape composed of a first longitudinal side wall, a second longitudinal side wall opposite to said first side wall, a bottom transverse side wall formed on a bottom portion between the first and second side walls, and an upper transverse side wall formed on an upper portion between the first and second side walls opposite to said bottom side wall;
a second cover having a rectangular shape corresponding to said first cover and combinable with said first cover to form a lock casing having a latching slot formed therein;
a plurality of dials pivotally mounted on said first cover proximate to said first longitudinal side wall each sleeve having a divergent notch formed therein;
a plurality of sleeves resiliently retained on said dials each said sleeve rotatably engageable with each said dial;
a lateral detent means transversely formed on said first cover resiliently tensioned against said second longitudinal said wall towards the first longitudinal side wall;
a longitudinal actuator slidably formed on said detent means proximate to said second longitudinal side wall having a depression plate resiliently protruding outwardly from said upper side wall;
an interlockable latching means having the latch normally biased by a restoring spring to poke into the slot in said second cover for operatively engaging the eyelet formed in said second slider of the zipper fastener; and
a sliding coupler means generally formed as an elongate plate having a plurality of sleeve holes each sleeve hole having a taper extension engageable with said divergent notch of each said sleeve, said elongate plate normally resiliently retained towards said bottom side wall having a side notch operatively engageable with a detent extension of said detent means; said longitudinal actuator having a recess portion formed on a side wall thereof operatively engaged with said detent means for preventing the depression of said depression plate for locking said lock body, when the coupler means disengages from the sleeves to disengage the side notch of the coupler means from the detent extension of the detent means; said longitudinal actuator having a bottom angled block tangentially biasing another angled block formed on said latching means to retract said latch to disengage from the second slider for opening the lock.

4,884,420

CAGE WITH FLOATING NUT ASSEMBLY

A. Milton Finkel, No. Hollywood, and Stephan F. Bunka, Tarzana, both of Calif., assignors to Dennis E. McGoldrick, Trustee, Gardena, Calif.

Filed Feb. 24, 1986, Ser. No. 832,178
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—58 **24 Claims**



18. An improvement in a cage assembly securing together a pair of spaced platforms,
each of said spaced platforms including hole formations aligned with corresponding hole formation in the other of said platforms,
said improvement comprising
at least one flat side in each of said hole formations,
a rod,
a lock mechanism mounted to each of such hole formations in the upper of said platforms and having a flat side,
a fastening means mounted to each of such hole formations in the lower of said platforms and including a body having a flat side,
the flat sides on said lock mechanism and body engaging corresponding flat sides in corresponding aligned hole formations in the upper and lower platforms,
said lock mechanism and fastening means operatively connected to said rod,
a shoulder on said body disposed under the lower of said platforms and of dimension greater than the dimension of

its body's corresponding one of said hole formation in such lower platform, and

a curved spring washer seated between said shoulder and lower platform about such corresponding one of said hole formations in such lower platform.

4,884,421

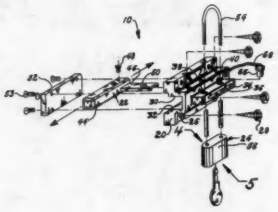
DOOR DEADBOLT LOCK

Stephen L. Lindsay, 34050 Wadsworth, Livonia, Mich. 48150

Filed Jun. 20, 1988, Ser. No. 208,973

Int. Cl.[4] E05B *65/06*

U.S. Cl. 70—129 1 Claim



1. A deadbolt type door lock assembly comprising:

a lock housing having an elongated bolt passageway, a mounting flange for attachment of said housing to a door and an extending plate along said housing having an elongated slot parallel to and communicating with said bolt passageway with first and second bores formed through said plate and traverse across said slot,

a bolt slidable in said bolt passageway between a retracted unlocked position and an extended locked position,

a blade affixed to said bolt and movable within said plate slot and having a hole therethrough wherein when said bolt is in said extended position, said blade hole is aligned with said first lock housing bore and aligned with said second lock housing bore when said bolt is in said retracted position,

a padlock assembly having a lock body with two major opposite face surfaces and a lock loop, said lock loop of a size to pass through both said lock housing bores and said blade hole with the bolt in either said extended or retracted positions, said lock loop being retained in place by said lock body with one of said major face surfaces displayed away from said door, said lock housing bores preventing said padlock assembly from being rotated to a position displaying the other of said opposite major face surfaces, and said lock body preventing removal of said lock loop by unauthorized persons to change the door unlocked or door locked condition of said lock, and

distinguishable indicia on said two major opposite face surfaces which can be viewed at a distance from said door whereby said lock body can be fastened on said loop with a first of said indicia being displayed and can also be fastened on said loop so that a second of said indicia is displayed whereby said indicia may be used to designate the door unlocked or door locked condition of said lock.

4,884,422

DEVICE FOR SECURING AUTOMOBILE WHEELS AGAINST THEFT

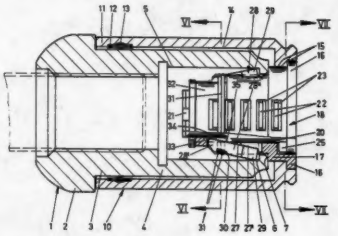
Heinz Wolter, Meiswinkel, Fed. Rep. of Germany, assignor to DOM Sicherheitstechnik GmbH & Co KG, Bruhl, Fed. Rep. of Germany

PCT No. PCT/GB86/00344, § 371 Date Jan. 25, 1988, § 102(e) Date Jan. 25, 1988, PCT Pub. No. WO87/07687, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 13, 1986, Ser. No. 150,405

Int. Cl.[4] F16B *41/00*

U.S. Cl. 70—165 6 Claims



1. Device for securing automobile wheels against theft, comprising:

a sleeve surrounding a polygonal head of a wheel nut or bolt, said sleeve being rotatable on said head and including a lock cylinder having a cylinder plug providing a keyway;

a locking member;

an inwardly extending radial shoulder on said wheel nut or bolt engaged by the locking member when the sleeve is pushed on the polygonal head, with rotation of said plug through a key inserted into said keyway disengaging said locking member from said radial shoulder;

said locking member comprising a double arm latch which extends in the longitudinal direction of the lock cylinder and includes a latch head arranged at one end, with the other end of said latch being engaged by an annular spring extending circumferentially around the cylinder plug.

4,884,423

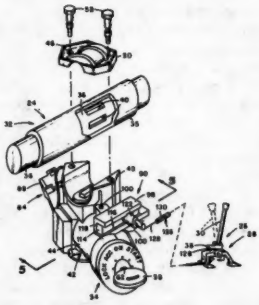
VEHICLE LOCK ASSEMBLY OPERABLE WITH TRANSMISSION SHIFTER AND METHOD

Ricky L. Fancher, Greeneville, Tenn., assignor to Hurd Lock and Manufacturing Co., Inc., Greeneville, Tenn.

Filed Jul. 7, 1988, Ser. No. 216,878

Int. Cl.[4] E05B *65/12*

U.S. Cl. 70—248 28 Claims



1. A steering lock assembly for utilization in a vehicle having

a steering arrangement and a transmission control member mounted for movement between one position corresponding to a PARK mode and another position corresponding to a non-PARK mode, said assembly comprising:

a key-operable switch including a housing mountable in a generally stationary condition within the vehicle and a keyway cylinder mounted within said housing for rotational movement relative thereto between first and second positions of rotational movement and including means defining an abutment surface for movement along an annular path as said keyway cylinder is rotated from said second position toward said first position;

means associated with said switch for locking the steering arrangement of the vehicle when the keyway cylinder is positioned in said first position; and

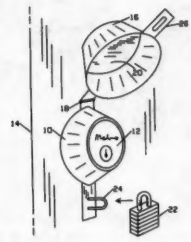
mechanical means associated with said switch for coupleement to the transmission control member for movement in response to movement thereof and for cooperating with the keyway cylinder so that when the transmission control member is positioned in a position corresponding to a non-PARK mode and said keyway cylinder is positioned in said second position of rotational movement, said keyway cylinder is prevented from being rotated from said second position to said first position so that the vehicle steering arrangement cannot be locked by said locking means as long as the transmission control member is positioned in a non-PARK mode position, said mechanical means including a stop member mounted for positioning in the path of said abutment surface when the transmission control member is moved out of the one position corresponding to the PARK mode for preventing the return of said keyway cylinder from said second position to said first position until the transmission control member is returned to the PARK mode position, said stop member cooperating with the transmission control member so that movement of said stop member into the path of said abutment surface is effected as the transmission control member is moved out of the one position corresponding with the PARK mode position.

4,884,424

MORTISE CYLINDER LOCK GUARD

David R. Meyer, 8610 NW. 21st Ct., Sunrise, Fla. 33322

Filed May 4, 1989, Ser. No. 347,340
Int. Cl.[4] E05B *17/14*
U.S. Cl. 70—427 7 Claims



1. A mortise cylinder lock guard for providing protection to a mortise cylinder lock when installed in a door, comprising in combination:

collar means for situating between a front face of said lock and said door and substantially surrounding said lock at an outer periphery thereof;

cover means, attached to said collar mean to substantially cover and prevent access to a keyhole of said lock;

hinging means for attaching said collar means and said cover means together to allow said cover means to be moved between an open and a closed position, said open position permitting access to said keyhole and said closed position preventing access to said keyhole; and

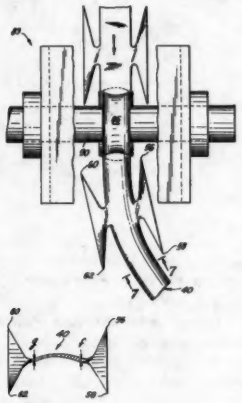
hasping means, coupled to said collar means and said cover means, for permitting locking of said cover means in said closed position by use of a secondary locking means.

4,884,425

ROLL FORMING APPARATUS FOR FORMING BARBED TAPE INTO A CODED CONFIGURATION

John W. Mainiero, 73 Bennetts Bridge Rd., Sandy Hook, Conn. 06482

Division of Ser. No. 236,652, Aug. 25, 1988, Pat. No. 4,833,904, which is a division of Ser. No. 876,715, Jun. 20, 1986, Pat. No. 4,784,373. This application Mar. 1, 1989, Ser. No. 317,642
Int. Cl.[4] B21D *11/06*
U.S. Cl. 72—9 3 Claims



1. A roll forming apparatus for forming a generally linear generally planar barbed tape into a generally circular coiled configuration, said apparatus comprising a pair of spaced apart rollers at least one of which is rotatably driven and which are operative to urge the tape therebetween, variable pressure means operatively connected to a portion of said roller for effecting a greater rolling pressure along one longitudinal side of said tape relative to the other longitudinal side of said tape, whereby said differential pressure causes a controlled thinning of said tape along one longitudinal side thereby causing said tape to assume a substantially circular coiled configuration with the plane of said tape being generally perpendicular to the axis of said coil, said apparatus further comprising coil sensor means for sensing the radius of curvature of the tape leaving said apparatus and a control means operatively connected to said variable pressure means and to said coil sensor means, said control means being operative to compare the sensed radius of curvature to a specified radius of curvature and to vary the pressure exerted by said variable pressure means in response to a difference between said sensed radius of curvature and the specified radius of curvature.

4,884,426

DEVICE FOR SPIRAL WINDING OF TAPES

Walter Schwarz, Lindenbühelweg 12 A-6020, Innsbruck, Austria

Division of Ser. No. 147,074, Jan. 20, 1988, Pat. No. 4,774,827, which is a continuation of Ser. No. 876,856, May 27, 1986, abandoned. This application May 27, 1988, Ser. No. 199,946
Claims priority, application Austria, Sep. 26, 1984, 3042/84
Int. Cl.[4] B21C *37/12*
U.S. Cl. 72—50 16 Claims

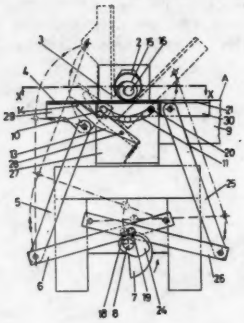
1. An apparatus for the continual spiral winding of a strip of

tape into a tube without a core and with an essentially angular cross-sectional profile, said device comprising:

a guide table defining a support plane;

a bar arranged in an end region of the tube being formed and extending at a spacing corresponding to the thickness of the strip of material above the guide table over at least two windings of the tube, said bar having a convexly curved conducting surface;

a bending tool which is pivotable about a pivot axis which is parallel to said support plane and coaxial with the axis of



curvature of said conducting surface, said bending tool being formed from a flat bending plate which is fitted into the guide table at the start of the bending operation, said flat bending plate having a top side for guiding the strip of material and being capable of rolling against the conducting surface and pivoting upwardly out of the support plane during the bending operation, wherein at the end of the bending operation, the bending plate pivots downwardly away from said conducting surface into the support plane about a second axis parallel to the pivot axis.

4,884,427

METHOD OF PRODUCING HELICAL INTERNAL GEAR

Kazuo Sawahata, Hitachi, and Hisanobu Kanamaru, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1987, Ser. No. 131,087

Claims priority, application Japan, Dec. 15, 1986, 61-296543

Int. Cl.[4] B21D *15/04*

U.S. Cl. 72—82 **1 Claim**

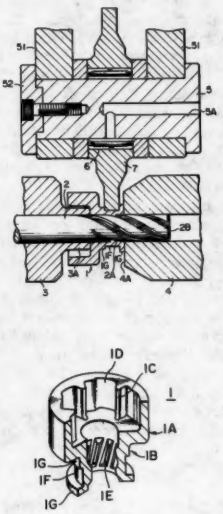
1. A method of forming a helical internal gear on an inner peripheral surface of a hollow blank comprising the steps of:

fitting said hollow blank onto a die on a mandrel, which die is provided on an outer periphery thereof with a helical tooth profile;

clamping and holding said blank at opposite axial ends of a portion thereof to be formed; and

pressing a roller onto an outer periphery of said blank in a direction prependicular to an axis of said mandrel while rotaring said blank together with said mandrel, whereby said blank is plastically deformed along said helical tooth profile; and

wherein said method further comprises the step of forming, simultaneously with the formation of said helical tooth



profile on the inner peripheral surface of said blank, a flange on at least one axial end portion of said blank.

4,884,428

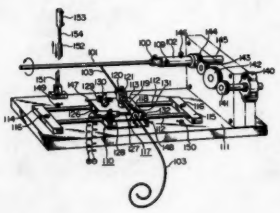
SPRING PRODUCING APPARATUS

Norio Matsuura, 6-10-16, Mino-o, Mino-o-shi, Osaka 562, Japan

Filed Apr. 25, 1988, Ser. No. 186,088

Int. Cl.[4] B21F *3/04*

U.S. Cl. 72—142 **1 Claim**



1. A spring producing apparatus, comprising in combination:

(a) vertical and horizontal support means, including a base (111);

(b) a chuck (100), having a forward end and a rear section, with a connecting member (102) at said rear section holding said chuck to the vertical support means, including transmission means for connecting said connecting member to a reversible motor with a clutch brake, also, said chuck (100) having an end face at said forward end with a stepped portion (104);

(c) an elongated cylindrical metal core (101) with a rear end which is removably and fittably mounted on said chuck forward end and held against free rotational motion by fastening means so as to be turned by the chuck;

(d) a pair of horizontal guide rails (112) mounted on said base (111) parallel to said metal core (101);
(e) a table (113) mounted on said guide rails including a linear guide (110) on said table, said table and linear guide (110) being adapted for motion parallel to said metal core (101);
(f) wire stock feed means, including a wire guide and pitch tool (117) on said table (113) including a tubular guide portion (118), a wire stock pressing portion (119), a pitch tool portion (121) incorporating a nozzle (120) for feeding wire stock (103) onto said metal core (101);
(g) an actuator (126) disposed on said linear guide (110) for movement together with the wire guide and pitch tool (117), so as to apply a predetermined pitch to the coils of the spring; and,
(h) a cutter (152) moved up and down by the operation of a cutting actuator (153) disposed for cutting the wire stock.

4,884,429

DECELERATOR APPARATUS FOR HOT ROLLED PRODUCT

Alexander I. Wilson, Sheffield, England, assignor to Morgan Construction Company, Worcester, Mass.

Filed Nov. 5, 1987, Ser. No. 117,623
Claims priority, application United Kingdom, Nov. 14, 1986, 8627279
Int. Cl.[4] B31B *39/20*
U.S. Cl. 72—250 **11 Claims**

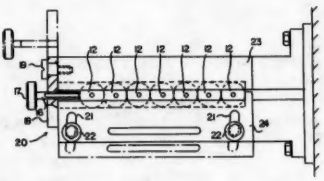
1. A method of decelerating lengths of hot rolled product issuing from a final rolling mill stand and passing along a track, the method being characterised by the step of bending a leading length of said product by deforming means acting on it in a direction perpendicular to its length to decelerate the leading length of the product relative to a following length of product being acted on by said rolling mill stand; shearing said leading length from said following length whilst said deforming means are still in motion; and switching the following length of rolled product into an alternate track for the subsequent deceleration of a further length of product by the same method.

4,884,430

FILAMENT DRAWING MACHINE

Kinzi Yoshida; Akira Yamamoto, and Kazuo Iura, all of Izumi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed Mar. 7, 1988, Ser. No. 164,805
Claims priority, application Japan, Apr. 24, 1987, 62-102356
Int. Cl.[4] B21C *3/12*
U.S. Cl. 72—281 **40 Claims**



1. A filament drawing device comprising a source of a plurality of strands to be drawn in a downstream direction, at least one die group comprising a plurality of separate dies, each die having an opening for drawing said strands through the die opening along a path, there being one die in said group for each of said strands, means for drawing said strands through said die group,

retaining means for each said group, each said retaining means comprising a first portion and a second portion adapted for movement relative to one another in a direction transverse to said path between an open position and a closed position,

said retaining means, when in its open position, having its first and second portions spaced apart a greater distance than when said retaining means is in said closed position.

retaining means, when in said closed positions, at least partially overlying said die group whereby said die group is retained in said device,

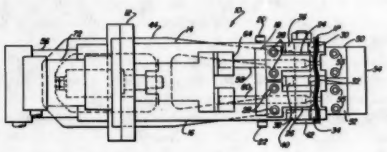
said first portion and said second portion, when said retaining means is in said open position, being spaced apart sufficiently to expose all said dies so that any die in said group may be recovered without removing any other die in said group, said first portion comprising a first recess which opposes a second recess in said second portion, said recesses extending in a transverse direction to said path and adapted to receive and retain said die group when said retaining means is in said closed position.

4,884,431

APPARATUS FOR BODY PANEL ATTACHMENT

Ernest A. Dacey, Jr., Highland, Mich., assignor to Utica Enterprises, Inc., Sterling Heights, Mich.

Filed Jul. 21, 1988, Ser. No. 222,184
Int. Cl.[4] B21D *28/04*
U.S. Cl. 72—334 **18 Claims**



1. An apparatus for reforming a first member having a relatively imprecise initial position to permit attachment to a second member having a predetermined fixed position, said first member having a first surface and a second surface which is opposed to said first surface said apparatus comprising:

at least one anvil;

movable means for supporting said at least one anvil at said predetermined fixed position;

at least two locating members disposed on opposite sides of said at least one anvil, said at least two locating members being connected to said movable means and movable relative to said at least one anvil;

means for moving said at least two locating members relative to said at least one anvil into contact with said first surface of said first member at said initial position and for locking said at least two locating members in said contact with said first surface of said first member;

a ram movably connected to said movable means, said ram having at least one form block movable therewith, said at least one form block facing said second surface of said first member and generally in alignment with said at least one anvil; and

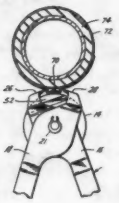
means for moving said ram to move said at least one form block toward said at least one anvil to deform a portion of said first member that is between said at least two locating members to engage said at least one anvil, said at least two locating members supporting said first member in said initial position during the deforming of said portion of said first member.

4,884,432

BACKUP FOR A CLAMP CRIMPER

Arthur I. Watson, Bartlesville, Okla., assignor to Camco, Incorporated, Houston, Tex.

Filed Feb. 21, 1989, Ser. No. 313,110
Int. Cl.[4] B21D *7/06*; B23P *11/00*
U.S. Cl. 72—410 **6 Claims**



1. In combination with a manually operated tool for tightening ear clamps having two complementary one piece lever arms pivotally connected at an intermediate point by a pivot pin, said arms having at one end handle portions and at the other ends complementary jaw portions, said other ends each including first and second spaced sides separated by a slot with the jaw portions extending across said slot, each of said arms including shoulder means cooperable with a backup disk comprising,

a one piece backup disk including a hole, said disk rotatably positioned in the slot between the first and second sides of each of the other ends of said arms with the disk hole encircling the pivot pin, said disk being rotatable about the pivot pin relative to said arms with said disk always positioned at a constant distance from said jaws,

an arcuate anvil positioned at the outer periphery of one section of the disk, said anvil forming an outer backup surface for engaging a clamp,

anvil shoulders positioned at each end of the anvil, said anvil shoulders engagable by the shoulders on the arms for rotating and holding said anvil adjacent said jaw portions as the jaws close.

4,884,433

PRESS APPARATUS FOR SMALL PRECISION PART

Heizaburou Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Company, Ltd., Japan

Continuation of Ser. No. 7,236, Jan. 27, 1987, Pat. No. 4,761,988. This application Apr. 7, 1988, Ser. No. 178,698
Claims priority, application Japan, Jan. 28, 1986, 61-16335
Int. Cl.[4] B21J *13/00*
U.S. Cl. 72—446 **2 Claims**

1. A press having an input crank shaft, a slide operatively connected to said input crank shaft to move said slide vertically upon rotational or vertical movement of said input crank shaft, and shut height adjusting means, wherein said shut height adjusting means comprises:

(a) a motor-driven, substantially horizontal rotational shaft supported within said press;

(b) a plurality of roller gear cams disposed on said rotational shaft;

(c) a plurality of substantially vertical screw shafts mounted within said press, each of said screw shafts having a first threaded end portion and a second end portion;

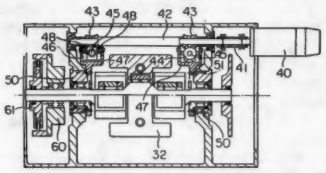
(d) an individual turret mounted at said second end portion of each of said screw shafts;

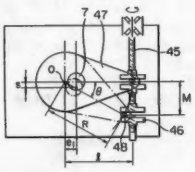
(e) a plurality of cam followers mounted on each of said turrets for engaging said roller gear cams;

(f) an individual vertically-movable block threadably engaging the first threaded end portion of each of said screw shafts;

(g) an arm having first and second end portions, said first end portion being operatively connected to said vertically movable block;

(h) an eccentric flange rotatably mounted at said second end portion of said arm and operatively connected to said





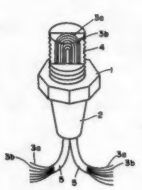
input crank shaft, whereby vertical movement of said movable block pivots said arm to rotate said eccentric flange and provide vertical movement to said input crank shaft and thereby adjust the shut height of said press.

4,884,434

WEAR SENSOR

Takeshi Satake, Itami, Japan, and Yoshiyuki Imada, Fort Lee, N.J., assignors to Mitsubishi Cable Industries, Ltd., Amagasaki, Japan

Continuation of Ser. No. 89,761, Aug. 27, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 309,988
Claims priority, application Japan, Aug. 29, 1986, 61-132838[U]
Int. Cl.[4] G01M *11/08*; G01N *17/00*; G08B *21/00*
U.S. Cl. 73—7 **10 Claims**



1. A wear sensor comprising:

a block having a wearing surface, a periphery of said block including at least one curved surface; and

a plurality of optical waveguide members, each having a segment disposed within said block substantially adjacent to and following the contour of said curved surface, said segments being successively disposed at spaced apart distances from one another in a direction parallel to a longitudinal axis of said block, a first and second end of each of said plurality of optical waveguide members being connected to a light source and a light receiving element, respectively, such that each member when intact transmits light from the light source to the light receiving element, said segments being arranged such that wear of said wear-

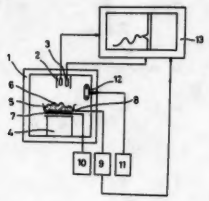
ing surface causes successive breakage of individual segments.

4,884,435

ODOR IDENTIFYING APPARATUS AND METHOD

Katsuo Ehara, 4-18-6, Kamisaginomiya, Nakano, Nakano-Ku, Tokyo-yo, Japan

Filed Nov. 17, 1988, Ser. No. 272,465
Claims priority, application Japan, Nov. 17, 1987, 62-288574
Int. Cl.[4] G01N *31/00*
U.S. Cl. 72—23 14 Claims



1. An odor identifying apparatus comprising: a gas sensor unit including at least two sensors having different characteristics for simultaneously detecting odorous components arising from a sample and outputting detection signals; and

display means for displaying detection results from said sensor unit as a single composite output signal representing a ratio between outputs from said respective gas sensors.

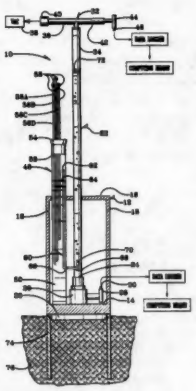
wherein an ozone gas generator is provided for supplying ozone gas into a chamber in which said sample is placed.

4,884,436

AUTOMATED TENSION INFILTROMETER

Mark D. Ankeny; Thomas C. Kaspar, and Robert Horton, Jr., all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 20, 1988, Ser. No. 260,022
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 13 Claims



1. An automated tension infiltrometer comprising:

a soil contacting base;

a liquid permeable, porous plate means secured to the base for interfacing the infiltrometer with soil to be tested;

a Marriotte column means for providing a source of constant hydraulic pressure secured to the base and having an open bottom end abutting the plate means;

bubble tower means secured to the base including a bubble tube means extending into the Marriotte column means for providing bubbles of adjustable volume, size, and frequency to the Marriotte column means to set tension in the Marriotte column means;

upper transducer means for monitoring the pressure at the top of the Marriotte column means;

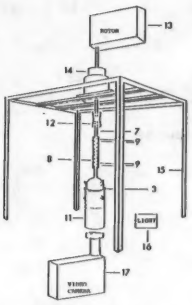
lower transducer means for monitoring the pressure at the lower end of the Marriotte column means, the monitoring of pressure at the upper and lower transducer means allowing various soil characteristics to be obtained.

4,884,437

METHOD AND APPARATUS FOR MEASURING FLUID-FLUID INTERFACIAL RHEOLOGICAL PROPERTIES

W. David Constant; Joanne M. Wolcott, both of Baton Rouge, and Vivian J. Cambridge, Slidell, all of La., assignors to Louisiana State University, Baton Rouge, La.

Filed Aug. 8, 1988, Ser. No. 229,702
Int. Cl.[4] G01N *11/00*
U.S. Cl. 73—54 20 Claims



1. Apparatus for measuring fluid-fluid interfacial rheology comprising:

A. a cylindrical cell capable of containing fluids and having a closed transparent bottom and a top capable of being opened and closed with seal means; and

B. means attaching a drive shaft to said top; and

C. a circular rotor suspended above said cylindrical cell such that the lower surface of said rotor contacts said drive shaft through connecting means and said rotor and said drive shaft are positioned such that the axis of said rotor and said drive shaft drive are concentric with the axis of said cylindrical cell, and freely rotatable about said axis of said cylindrical cell; and

D. means for observing through said bottom of said cylindrical cell; and

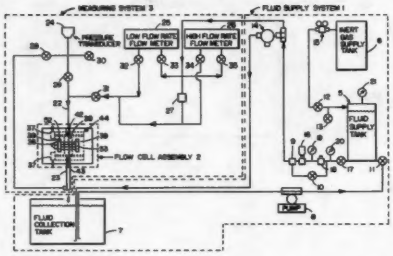
E. frame support means supporting said cylindrical cell and suspending said rotor.

4,884,438

METHOD AND APPARATUS FOR MEASURING FLUID FLOW PARAMETERS THROUGH NATURALLY FRACTURED MEDIA

Timothy A. Jones, Carrollton; Thomas J. Kaluza, and Robert E. Roach, both of Dallas, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 20, 1988, Ser. No. 260,350
Int. Cl.[4] E21B *49/00*
U.S. Cl. 73—153 **35 Claims**



1. An apparatus for the study of fluid flow through naturally fractured media, comprising:

(a) a flow cell assembly for passing a test fluid through naturally fractured media having a housing for mounting the media within;

(b) means for mounting the naturally fractured media within said housing so that the fracture is aligned to permit the test fluid to be introduced substantially parallel to the fracture; and

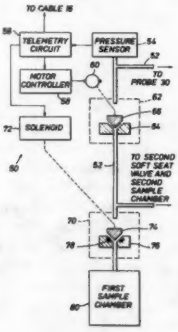
(c) means for permitting adjustment of an aperture formed by the fracture so that varied apertures may be established.

4,884,439

HYDRAULIC CIRCUIT USE IN WIRELINE FORMATION TESTER

Gary K. Baird, Richmond, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed Jan. 26, 1989, Ser. No. 301,415
Int. Cl.[4] E21B *49/10*
U.S. Cl. 73—155 **10 Claims**



1. For use in a formation tester supported on a well logging cable and suspended in a well borehole, a formation tester having an extendible probe therein wherein the probe connects to a sample line and the sample line delivers a formation sample, the formation tester comprising:

(a) a series choke means in said sample line for controlling the rate of sample flow through said sample line;

(b) valve means having a valve element and valve seat cooperatively closing together to block flow through said sample line, and wherein said valve means includes a relatively soft component;

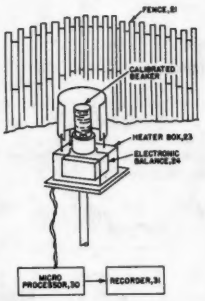
(c) fluid sample storage means for receiving samples from said sample line for storage.

4,884,440

PROCESS FOR THE ELIMINATION OF NOISE FROM DATA

Robert O. Berthel, Windham, N.H., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 25, 1988, Ser. No. 173,920
Int. Cl.[4] G01W *1/14*
U.S. Cl. 73—170 R **1 Claim**



1. An improved snow rate measuring system which determine a set of ideal values which represent a rate of snowfall, said improved snow rate measuring system comprising:

a means for collecting falling snow;

an electric balance which receives and weighs said falling snow from said collecting means to produce a series of measurement signals in an actual data stream which indicates the rate of snowfall, said measurement signal being subject to wind-induced noise in said actual data stream;

a means for displaying said plot of ideal values along with said actual data stream; and

an electronic digital signal processor which receives said actual data stream from said electronic balance and which produces an output to said displaying means which includes said ideal value as well as said actual data stream, said electronic digital signal processor comprising a general purpose data processor which is programmed with an approximation routine which comprises:

D(n) =	Data (raw) array
X(n) =	Point number array for plotting
Y(n) =	Weight array plotting
A =	Average of 3 points
L =	Magnitude limit
N =	Number of plotting points
P =	Point number at start of QP search
W =	Weight at preceding QP
W1 =	Delta weight between adjacent QPs
100	N = 1
110	P = 1
120	L = 0.1
	(Iteration)
130	For I = P + 1 to 399
140	A = (D(I − 1) + D(I) + D(I + 1)/3 (Eq 1)
150	For J = I − 1 to I + 1

-continued

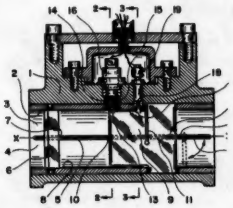
```
160   If A - D(J) > L then 350 (check search limit)
170   If D(J) - A > L then 350 (check search limit)
180   Next J
      (QP found)
190   If N > 1 then 230 (validity check)
      (initial plotting point)
200   X(N) = I
210   Y(N) = A
220   Go to 320 (continue sampling)
      (Validity check)
230   If A - W L then 260 (valid QP)
      (Increasing magnitude limit)
240   L = L[.] + .01
250   Go to 130 (iteration)
      (Valid QP)
260   W1 = (A - W/(I - P) (Eq. 2)
      (Interpolation)
270   For J = P + 1 to I
280   N = N + 1
290   X(N) = J
300   Y(N) = W + W1*(J - P) (Eq. 3)
310   Next J
      (Continue sampling)
320   P = I
330   W = A
340   L = .01
      (Search limit)
350   If I - P > 100 then 240 (increase magnitude
      limit)
360   Next I.
```

4,884,441

VARIABLE CAPACITY FLOWMETER

Hyok Sang Lew, 7890 Oak St., Arvada, Colo. 80005

Filed May 11, 1988, Ser. No. 192,836
Int. Cl.[4] G01F *7/00*
U.S. Cl. 73—195 **26 Claims**



1. An apparatus for measuring fluid flow comprising in combination:

(a) a body including a bore extending from one extremity to the other extremity of the body;

(b) a divider planar member disposed generally parallel to the central axis of the bore and dividing the bore into two flow passages;

(c) shut-off means for closing and opening one of said two flow passages;

(d) a vortex generator of an elongated cylindrical shape disposed across said two flow passages in a generally perpendicular relationship to the divider planar member and extending through a clearance opening disposed through the divider planar member wherein a gap between the vortex generator and boundary of the clearance opening allows communication of fluid pressure between the two flow passages;

(e) a vortex sensor of an elongated planar shape disposed across the two flow passages downstream of the vortex generator and extending through a clearance opening through the divider planar member, wherein at least one extremity of the vortex sensor is secured to the body at least in part; and

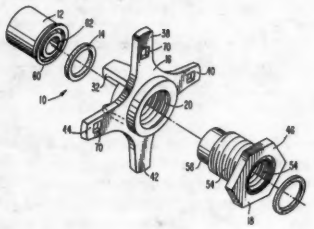
(f) a transducer connected to a deflective portion of the vortex sensor for determining alternating fluid dynamic forces generated by vortex shedding from the vortex generator and experienced by the vortex sensor as a measure of fluid flow.

4,884,442

EXPANSION MECHANISM FOR METER BOX OR METER YOKE

José M. Rivero-Olmedo, P.O. Box ER, Carolina, P.R. 00628

Continuation of Ser. No. 251,987, Sep. 29, 1988, and a continuation of Ser. No. 170,644, Mar. 16, 1988, abandoned, which is a continuation of Ser. No. 816,903, Jan. 8, 1986, abandoned. This application Mar. 24, 1989, Ser. No. 328,226
Int. Cl.[4] G01F *15/18*
U.S. Cl. 73—201 **28 Claims**



1. An expansion mechanism for connecting a meter within a meter box or yoke, comprising:

a hand wheel having a partially threaded axial opening therethrough with an annular rim extending inwardly into said axial opening, and positioning prongs at one end of said axial opening;

a bushing having an outer threaded portion cooperating with said partially threaded axial opening in said hand wheel, a sleeve cooperating with and providing a close fit with said annular rim, and means for operatively connecting said bushing to a conduit defined by an at least partially threaded axial opening through said bushing;

wherein threads of said at least partially threaded axial opening through said bushing at least partially overlap in the axial direction with said outer threaded portion of said bushing;

a cup comprising a sleeve having a flaring rim at one end and an opening at an opposite end thereof, said cup being retained by said prongs of said hand wheel; and

an annular gasket positioned about said sleeve of said bushing, and located between said flaring rim and said annular rim, whereby threaded movement between said hand wheel and said bushing may place sealing pressure on said annular gasket.

4,884,443

CONTROL AND DETECTION CIRCUITRY FOR MASS AIRFLOW SENSORS

Ki W. Lee, Williamsburg, and Charles R. Cook Jr., Newport News, both of Va., assignors to Siemens-Bendix Automotive Electronics L. P., Troy, Mich.

Filed Dec. 23, 1987, Ser. No. 137,220
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204.16 **33 Claims**

1. A mass airflow sensor comprising:

a substrate having a thin dielectric diaphragm surrounded by a heavily doped silicon rim; with

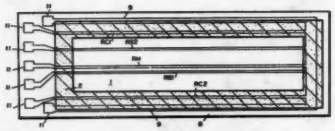
a primary circuit, disposed on said substrate, including:

a heating element disposed on said substrate diaphragm,

a first non-heated ambient temperature sensing means (RC1) disposed on said substrate rim and thermally isolated from said heating element for sensing ambient temperature,

a first heated temperature sensing means (RS1) disposed on said substrate diaphragm and thermally coupled to said heating element through said diaphragm for sensing temperature, and

first means, electrically coupled to said heating element, said first heated temperature sensing means (RS1), and said non-heated ambient temperature sensing means (RC1), for maintaining a substantially constant temperature difference between the temperature of said heating element and the ambient temperature sensed by said non-heated, ambient temperature sensing means, said first means including means for applying a continuous current flow to said heating element and for continually adjusting the magnitude of said current flow in response to the difference



between the temperature sensed by said temperature sensing means (RS1) and the ambient temperature sensed by said non-heated temperature sensing means (RC1); and

a slave circuit operating independently of said primary circuit but thermally coupled to said heating element through said substrate, said slave circuit comprising:

a second non-heated ambient temperature sensing means (RC2) disposed on said substrate rim and thermally isolated from said heating element for measuring ambient air temperature,

a second heated temperature sensing means (RS2) disposed on said substrate diaphragm in an air flow stream and thermally coupled to said heating element through said substrate diaphragm for sensing temperature, and

second means, coupled to said second non-heated ambient temperature sensing means (RC2) and to said second heated temperature sensing means (RS2) for generating a signal indicative of the flow of said air flow stream.

4,884,444

MOTOR-DRIVEN MATERIAL LEVEL INDICATOR

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Division of Ser. No. 200,942, Jun. 1, 1988, Pat. No. 4,827,768, which is a continuation-in-part of Ser. No. 56,160, Jun. 1, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 315,155

Int. Cl.[4] G01F *23/22*

U.S. Cl. 73—290 R **7 Claims**

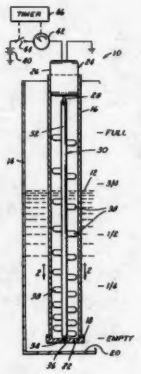
1. Apparatus for indicating level of fluent material in a vessel comprising:

an electric motor having an output shaft,

a shaft extending vertically through said vessel, said shaft having one end coupled to said motor output shaft for rotating said shaft about its axis within said vessel, and another end rotatably supported by said vessel,

a plurality of discrete vanes of identical contour spaced from each other non-uniformly lengthwise of said shaft, integrally radially projecting from said shaft in physical contact with material in said vessel such that rotation of said shaft is retarded as a direct function of level of material in said vessel,

means for applying electrical energy to said motor for rotating said impeller means within said vessel, and



means for indicating level of material in said vessel as a function of load applied to said motor by said impeller means.

4,884,445

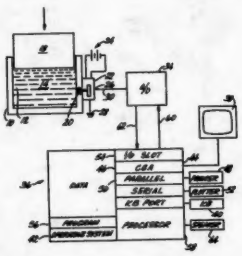
GRIP STRENGTH ANALYZER APPARATUS AND METHOD OF USING SAME

Armin M. Sadoff, 465 N. Roxbury Dr., Beverly Hills, Calif. 90210; Richard C. Nelson; Gerald A. Smith, both of State College, Pa.; Joseph Johnstonbaugh, Port Matilda, Pa., and Stevn J. Sadoff, St. Louis, Mo., assignors to Armin M. Sadoff, Beverly Hills, Calif.

Filed Nov. 28, 1988, Ser. No. 276,716

Int. Cl.[4] A61B *5/22*

U.S. Cl. 73—379 **16 Claims**



1. A method for measuring grip strength of a subject, comprising the steps:

(a) providing a grip strength dynamometer with a transducer having an electrical output which produces an analog signal representative of the force with which the dynamometer is gripped;

(b) coupling the electrical output from the transducer to an input of a digital computer via an analog to digital converter;

(c) having the subject grip the dynamometer with a maximal contraction effort for a first predetermined period of time using a designated first hand;

(d) inputting to the computer digital data representative of samples of the gripping force applied to the dynamometer during the first predetermined period;

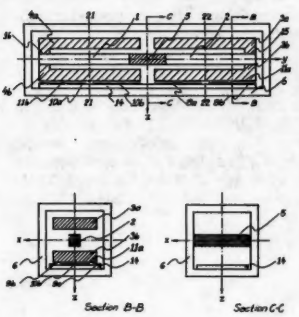
(e) calculating for the first hand from the sampled force data a first value for a first discriminator;
(f) inputting to the computer digital data samples of the applied force while the subject is gripping the dynamometer with a maximal contraction effort for a second predetermined period of time but with his other hand;
(g) calculating a second value for said first discriminator from the sampled second hand force data;
(h) comparing the calculated first and second hand values of the first discriminator to calculate a value for a second discriminator based on the difference thereof;
(i) combining the calculated second discriminator value with the calculated value of another discriminator having a different statistical distribution to that of the second discriminator to form a combined discriminator value; and
(j) determining whether the combined discriminator value is within a range that has previously determined experimentally to indicate with a predetermined level of confidence the sincerity of the subject.

4,884,446

SOLID STATE VIBRATING GYRO

Per B. Ljung, 32 Hemlock Ter., Wayne, N.J. 07470

Continuation-in-part of Ser. No. 24,977, Mar. 12, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 259,483
Int. Cl.[4] G01P *9/04*
U.S. Cl. 73—505 **17 Claims**



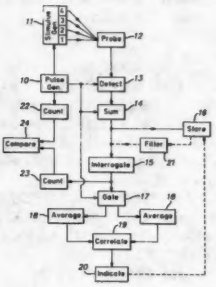
1. An angular rate sensor comprising:
(a) an elastic element having high axial, radial and torsional stiffness including:
(i) two elastic beams; and
(ii) a common support joining the two elastic beams;
(b) two inertia members balanced such that their respective centers of gravity would remain static when the inertia members are angularly vibrated;
(c) means for angularly vibrating the inertia members in a first plane such that the inertia members have respective angular vibrational nodal points coinciding with their corresponding centers of gravity;
wherein each of the inertia members is respectively tightly coupled to a free end of corresponding one of the elastic beams such that the inertia members are not supported at their respective vibrational nodal points so that when at least one of the inertia members is angularly vibrated about its center of gravity, no substantial vibrational energy is lost since the inertial members are not supported at their respective vibrational nodal points and a high Q-value is thereby generated.

4,884,447

HEARING FACULTY TESTING

David T. Kemp, 15 Burleigh Mead, Hatfield, Hertfordshire AL9 5ED, and Peter Bray, 2 Ingleside, Mill Lane, Hookwood, Horley, Surrey RH6 0HX, both of England

Filed Jun. 6, 1988, Ser. No. 202,320
Claims priority, application United Kingdom, Jun. 4, 1987, 8713116
Int. Cl.[4] A61B *5/04*
U.S. Cl. 73—585 **4 Claims**



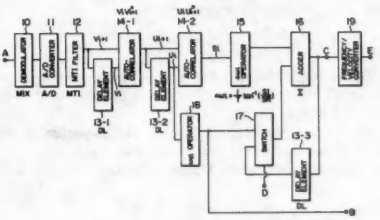
1. Hearing faculty testing apparatus comprising:
means for repetitively applying to a patient's ear a linearly balanced sequential set of sound stimuli,
means for detecting and producing a related set of electrical output signals representing the responses from said ear to said stimuli,
means for individually summing each said set of output signals to produce a corresponding sum signal,
means for interrogating each said sum signal to detect components above a predetermined threshold,and
means for averaging said sum signals on a selective basis in response to said interrogation means,
wherein said averaging means comprises two like averagers, and said interrogation means operates to apply said sum signals selected for averaging to said averagers in successive alternating manner.

4,884,448

ULTRASONIC DOPPLER METER

Toshio Ogawa; Hisashi Nishiyama; Kageyoshi Katakura, all of Tokyo, and Shizuo Ishikawa, Kanagawa, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 230,972
Claims priority, application Japan, Sep. 24, 1987, 62-237211
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—597 **3 Claims**



3. An ultrasonic Doppler apparatus according to claim 2, wherein said accumulating means comprises:
means for adding a plurality of inputs, one of said plurality of

inputs being said output signal indicative of said differential Doppler frequency, and producing an output signal indicative of the sum of said plurality of inputs;

means for delaying the output of said adding means;

means for switching another of said plurality of inputs of said adding means between said output of said Doppler frequency deriving means and said delayed output of said adding means; and

wherein said switching means supplies said adding means with an initial output of said Doppler frequency deriving means at a beginning of said velocity measurement and supplies said adding means with said delayed output of said adding means thereafter.

4,884,449

APPARATUS FOR DETECTING A FAILURE IN BEARINGS

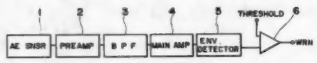
Shigeto Nishimoto; Yoshiki Fujimoto, both of Osaka; Noriaki Inoue, Sohja, and Shunji Harada, Ashiya, all of Japan, assignors to Koyo Seiko Co., Ltd, Osaka and Kawasaki Steel Corporation, Hyogo, both of, Japan

Filed Jun. 3, 1988, Ser. No. 201,968

Claims priority, application Japan, Jun. 3, 1987, 62-140481; Jun. 3, 1987, 62-140482; Jun. 3, 1987, 62-140484; Jun. 3, 1987, 62-140485; Jun. 3, 1987, 62-140486

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—660 **5 Claims**



1. An apparatus for detecting a failure in a bearing comprising:

an acoustic emission sensor for detecting an acoustic emission from the bearing and for outputting signals indicative of power of the acoustic emission, the acoustic emission being related to the failure of the bearing;

a bandpass filter for passing only those signals received from said sensor in the range of from 100 kHz to 500 kHz; and

a comparison means for comparing each of the signals in the range of from 100 kHz to 500 kHz extracted by the bandpass filter with a predetermined threshold value and for outputting an event signal when the signal from the bandpass filter exceeds the threshold value;

a period determination means for receiving the event signals from the comparison means and for determining time intervals in which the event signals occur, the time intervals being related to the portion of the bearing suffering a failure;

a totalizing means for totaling the number of event signals for respective time intervals determined by the period determination means; and

a judging means for judging a bearing failure when the number of events totaled by the totalizing means exceeds a predetermined threshold value.

4,884,450

SENSOR DEVICE

John C. Greenwood, Harlow; Peter W. Graves, Dunmow, and Rosamund C. Neat, London, all of Great Britain, assignors to STC PLC, London, England

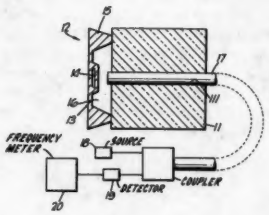
Continuation of Ser. No. 115,765, Nov. 2, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,501

Claims priority, application United Kingdom, Nov. 3, 1986, 8626208

Int. Cl.[4] G01L *11/00*

U.S. Cl. 73—702 **5 Claims**

1. A remote pressure sensor comprising a self-contained assembly, and including a generally cylindrical optical fibre ferrule formed from a borosilicate glass and on one end of which a single crystal silicon structure incorporating a pressure responsive diaphragm is mounted and secured thereto, the single crystal silicon structure defining an air-tight cavity between the diaphragm and the ferrule end, said cavity being evacuated so as to provide an absolute pressure reference and a single crystal silicon resonator element integral with and extending from the diaphragm into the cavity and responsive by variation of its resonant frequency to flexure of the diaphragm resulting from pressure applied thereto, the resonator element being disposed in register with and directly optically coupled to an optical fibre supported and permanently secured,



in alignment with the resonator element, over a significant length adjacent its end in the ferrule whereby to provide means for maintaining the resonator element in a state of resonance at a resonant frequency, corresponding to the applied pressure, by an input optical signal, derived from feedback means and modulated with the resonant frequency, directed on to the resonator element via the fibre, said fibre further providing means for transmitting from the resonator element an output optical signal modulated with the resonator frequency corresponding to the applied pressure.

4,884,451

FLUID PRESSURE MEASURING DEVICE WITH PRESSURE ATTENUATION

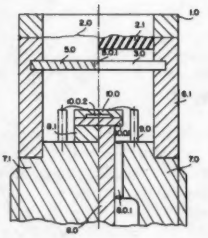
Dieter Schulze, Verl, Fed. Rep. of Germany, assignor to Parker-Ermeto GmbH, Bielefeld, Fed. Rep. of Germany

Filed Apr. 18, 1988, Ser. No. 182,545

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1987, 3713236

Int. Cl.[4] G01L *7/08, 9/06*

U.S. Cl. 73—706 **4 Claims**



1. An improved device for measuring pressures in a hydraulic or pneumatic system of the type having a piezoresistive pressure measuring cell disposed within a pressure housing in a pressure chamber filled with a separating fluid and separated from the medium to be measured by means of a diaphragm, the improvement comprising:

a pressure attenuation element disposed in said pressure housing so that an attenuated pressure is transferred therethrough;

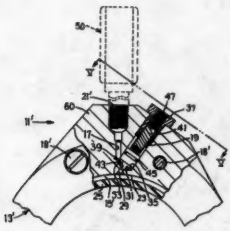
and said diaphragm having an elastic protective layer thereon turned toward said pressure attenuation element.

4,884,452

PRESSURE MONITORING DEVICE ISOLATOR

Danny K. Kaiser, Three Rivers, Mich., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Aug. 31, 1988, Ser. No. 238,921
Int. Cl.[4] G01L 7/08
U.S. Cl. 73—730 8 Claims



1. A pressure monitoring device isolator for a pressure sensor capable of measuring the pressures of fluid in a pipeline, comprising:

an annular member axially interposable in the pipeline for measuring the pressure of fluid in the pipeline, the annular member having a central passage through which fluid in the pipeline passes;

an annular sensing fluid chamber and an annular seal member separating said sensing fluid chamber from said central passage, said annular sensing fluid chamber being surrounded by said annular member and having sensing fluid therein;

an opening in the outer periphery of said annular member, said opening being adapted to receive a pressure monitoring device;

a sensing fluid passage extending radially inward in said annular member from the radially inner end of said opening;

means for preventing significant loss of sensing fluid through said opening when said pressure monitoring device is removed from said opening, even with said annular sensing fluid chamber subject to pressure from fluid in said pipeline, said means comprising a valve passage extending in from the periphery of said annular member to said annular sensing fluid chamber at an angle to said sensing fluid passage, said valve passage having radially outer, middle and inner portions, said inner portion being substantially smaller in cross-sectional area than said outer portion, said inner portion being joined to said middle portion at an outward facing valve seat, said inner portion of said valve passage opening into said annular sensing fluid chamber, said sensing fluid passage having a radially inner end opening into said outer portion of said valve passage, thereby allowing communication of said sensing fluid passage with said sensing fluid chamber through said valve passage;

a valve member adapted to seat against said valve seat, said valve member having a head sealable against said seat to thereby interrupt communication of said sensing fluid passage with said sensing fluid chamber; and

a seal ring located in an annular groove in said head of said valve member and slidably engaging the large diameter portion of said outer portion of said valve passage to prevent leakage of sensing liquid outward through said valve passage.

4,884,453

STRAIN GAUGE

Horst Hoffmann, Pentling; Peter Kersten, Leonberg; Hans Volz, Schwieberdingen, and Ulrich Seyfried, Stuttgart, all of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Division of Ser. No. 73,355, Jul. 10, 1987, Pat. No. 4,782,705, which is a continuation of Ser. No. 821,638, Jan. 23, 1986, abandoned. This application Jul. 22, 1988, Ser. No. 222,799
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1985, 3502008
Int. Cl.[4] G01L 1/00
U.S. Cl. 73—776 1 Claim

1. A strain gauge comprising:

a substrate;

a first thin amorphous metal film strip having a longitudinal axis, a free end and a contact end, said first film being disposed on said substrate;

an insulating layer disposed above said first film strip;

a second thin amorphous metal film strip also having a longitudinal axis, a free end and a contact end, said second film strip longitudinal axis being collinear with said first film strip longitudinal axis, said second film strip being disposed above said insulating layer, said first and second film strips being electrically coupled together at their respective contact ends; and

first and second electrical contacts in electrical connections with the respective free ends of said first and second film strips,

only one domain being formed in each of said strips, said only one domain having an energetically favorable direction of magnetization perpendicular to the corresponding film strip longitudinal axis,

said one domain of said first film strip being antiparallel with respect to said one domain of said second film strip,

whereby strain is measured by evaluating change in direct current conductivity between said first and second electrical contacts.

4,884,454

MANBASKET TESTING APPARATUS AND METHOD

Roy L. Johnson, Oregon City, Oreg., assignor to Lifting Technologies, Inc., Missoula, Mont.

Filed Nov. 14, 1988, Ser. No. 270,207
Int. Cl.[4] G01N 3/00
U.S. Cl. 73—788 13 Claims

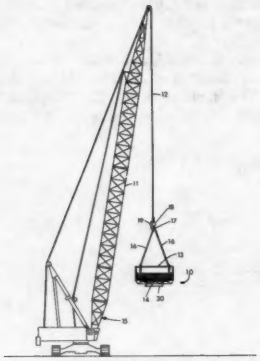
1. A manbasket testing apparatus comprising:

a manbasket having a floor;

sling means for suspending the manbasket from a crane, said sling means attached to the manbasket; and

weight means removably attached to and positioned underneath the floor of the manbasket wherein said weight

means is comprised of a fixed weight having an upper surface and wherein the upper surface of said weight



provides attachment means for removably attaching said weight to said manbasket.

4,884,455

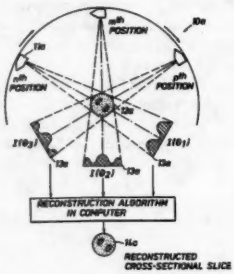
METHOD FOR ANALYSIS OF FAILURE OF MATERIAL EMPLOYING IMAGING

Harold J. Vinegar; Scott L. Wellington, both of Houston, Tex., and Jannetje A. de Waal, Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 66,179, Jun. 25, 1987, Pat. No. 4,856,341. This application Jan. 31, 1989, Ser. No. 304,751

Int. Cl.[4] G01N *3/00*

U.S. Cl. 73—798 **12 Claims**



1. A method for determining at least one preselected property of a sample of material employing an imaging apparatus comprising:

imaging said sample during the application of known preselected forces to said sample, and

determining density in said sample responsive to said preselected forces.

4,884,456

HIGH TEMPERATURE EXTENSOMETER SYSTEM

Harry R. Meline, Minnetonka, and Scott P. Iverslie, Crystal, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Apr. 26, 1988, Ser. No. 186,367

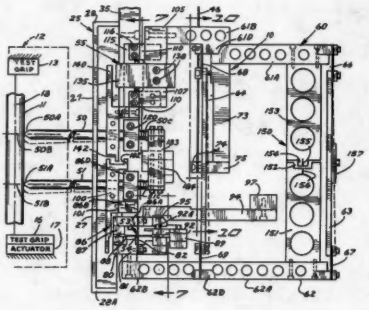
Int. Cl.[4] G01B *5/30;* **G01N** *3/08, 17/00*

U.S. Cl. 73—826 **25 Claims**

1. An extensometer apparatus comprising:

a parallelogram linkage support frame for supporting at least two specimen contact means which have outer ends adapted to engage a specimen in spaced locations, and including means for indicating movement of the specimen contact means along the loading axis of such specimen, said parallel linkage support frame including a parallelogram linkage having first and second spaced apart substantially parallel beams, and third and fourth spaced apart substantially parallel beams positioned at right angles to the first and second beams;

means for hingedly coupling the third and fourth beams to the first and second beams at spaced locations thereon, respectively;



means for coupling a first of the specimen contact means to a first beam; and

means for coupling a second of said specimen contact means to the second beam, including means for indicating movement of the outer end of said second specimen contact means in direction along a loading axis of such specimen to be tested, the specimen contact means having axes substantially parallel to the axes of said first and second beams at a reference position of the specimen contact means.

4,884,457

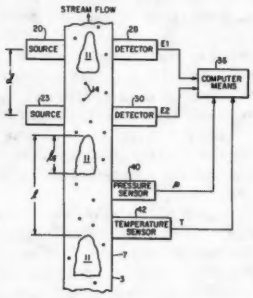
MEANS AND METHOD FOR MONITORING THE FLOW OF A MULTI-PHASE PETROLEUM STREAM

Gregory J. Hatton, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 102,943, Sep. 30, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 327,873

Int. Cl.[4] G01F *1/74*

U.S. Cl. 73—861.04 **14 Claims**



1. Apparatus for monitoring a multi-phase petroleum stream flowing in a pipe comprising:

two density sensing means for sensing the density of the

petroleum stream at two locations a known distance apart and providing sensed density signals, corresponding to the sensed densities and which are related to a fluid velocity of the petroleum stream,

temperature sensing means for sensing the temperature of the petroleum stream and providing a temperature signal representative of the sensed temperature,

pressure sensing means for sensing the pressure of the petroleum stream and providing a pressure signal in accordance with the sensed pressure, and

flow rate means connected to both density sensing means, to the pressure sensing means and to the temperature sensing means for entering known values of gas density liquid density and a surface tension of gas and for providing signals corresponding to the liquid flow rate and to the gas flow rate of the petroleum stream in accordance with the sensed density signals, the temperature signal, the pressure signal and entered known values of the gas and the liquid.

4,884,458

HIGH SENSITIVITY VORTEX SHEDDING FLOWMETER

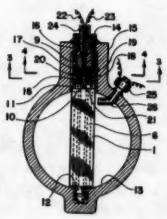
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 920,977, Oct. 20, 1986, Pat. No. 4,754,649, which is a continuation-in-part of Ser. No. 31,902, Mar. 30, 1987, Pat. No. 4,807,481, which is a continuation-in-part of Ser. No. 12,680, Feb. 9, 1987, Pat. No. 4,803,870, which is a continuation-in-part of Ser. No. 133,315, Dec. 17, 1987. This application Jan. 25, 1988, Ser. No. 147,812

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[4] G01F *1/32*

U.S. Cl. 73—861.24 **12 Claims**



1. An apparatus for measuring fluid flows comprisng in combination:

(a) a flowmeter body including a flow passage;

(b) a vortex generator of an elongated cylindrical shpae disposed across a cross section of the flow passage, wherein at least one extremity of the vortex generator is secured to the flowmeter body;

(c) a transducer contained in a container vessel secured to the flowmeter body, wherein the transducer is pressed onto a thin wall of the container vessel; and

(d) a flexible coupling connecting said thin wall of the container vessel to a deflective portion of the vortex generating, wherein the flexible coupling enhances relative deflection between the vortex generator and the container vessel;

wherein fluctuating fluid dynamic forces resulting from vortices shed from the vortex generator and experienced by vortex generator generate fluctuating electrical signals from the transducer as a measure of fluid flow through the flow passage.

4,884,459

FLOW RATE CONVERTER

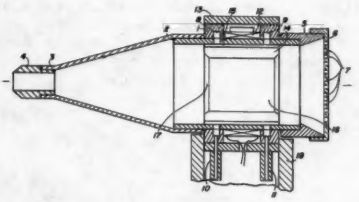
Yordan Y. Beyazov; Sasho G. Nenov, and Vlayko S. Peychev, all of Sofia, Bulgaria, assignors to Institute Po Technicheska Kibernetika I Robotika, Sofia, Bulgaria

Filed Jun. 16, 1988, Ser. No. 208,188

Claims priority, application Bulgaria, Jun. 16, 1987, 80178

Int. Cl.[4] G01F *1/40*

U.S. Cl. 73—861.52 **5 Claims**



1. A flow rate converter comprising

a body with a cylindric tube formed therein;

said tube being provided with inlet diffusing means at one end and outlet diffusing means at another end and a pair of spaced apart annular conduits;

said body being provided with a heating element and two pipe means communicating with said two annular conduits;

a replaceable cylindric body disposed in said tube, said replaceable body having a plurality of circumferential longitudinal axial channels communicating with said conduits;

said cylindric body also having a non-circumferential axial channel;

said non-circumferential channel having a cross-sectional area at least 2 times as large as the sum of the cross-sectional areas of said circumferential channels.

4,884,460

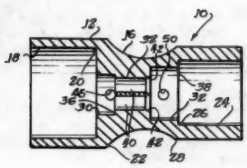
DEVICE FOR SENSING AIR FLOW

Christopher Nowacki, Long Grove, and Alfred G. Brisson, Kildeer, both of Ill., assignors to Northgate Research, Inc., Arlington Heights, Ill.

Filed Dec. 1, 1988, Ser. No. 278,372

Int. Cl.[4] G01F *1/40*

U.S. Cl. 73—861.52 **10 Claims**



1. A venturi device for sensing air flow comprising a body including first and second substantially cylindrical end portions and an intermediate center portion, said first and second end portions respectively having first and second outer diameters, said first and second end portions respectively having coaxial bores of respective first and second internal diameters, first and second counterbores in said intermediate center portion coaxial with and respectively having opposite open ends interconnecting with said first and second bores and respectively having first and second diameters smaller than either of said first and second internal diameters, means providing a

flow restriction interconnecting said counterbores and comprising a plurality of parallel coextensive axially directed bores of small diameter relative to said counterbores, and a pair of lateral bores through said intermediate portion and respectively in fluid communication with said counterbores on opposite sides of said small diameter bores.

4,884,461

FORCE SENSOR

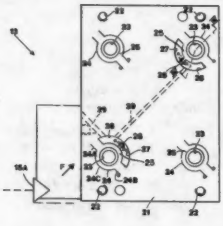
Wolfgang H. Sawicki, Mannheim, Fed. Rep. of Germany; Tomas L. Svensson, Göteborg, Sweden; Bernd K. Weck, Gorxheimertal, and Karl E. Meier-Dörnberg, Rossdorf, both of Fed. Rep. of Germany, assignors to Sandvik AB, Sandviken, Sweden

Filed Oct. 5, 1988, Ser. No. 253,586

Claims priority, application Sweden, Oct. 13, 1987, 8703952

Int. Cl.[4] B23Q *17/09*

U.S. Cl. 73—862.06 **7 Claims**



1. A force sensor for a machining tool of the type comprising a stable support portion and a carrier including a tool holder in which a cutting tool is mounted, said force sensor being mounted in between said stable support portion and said carrier, said sensor comprising a generally planar plate which includes slots therein defining first and second zones resiliently arranged relative to each other within the plane of said plate, said zones being interconnected by an interconnecting portion of said plate, said first zone being connected to said carrier and said second zone being connected to said stable support portion, said sensor provided with gauges on a side of said interconnecting portion, said force sensor being flexible only in said plane of said plate, and said gauges arranged to detect forces directed in said plane in response to a machining operation.

4,884,462

CONVEYOR BELT CROSS-STREAM SAMPLING SYSTEM AND METHOD

John B. Long, 421 Heron Hill Dr., Louisville, Tenn. 37777

Continuation of Ser. No. 915,746, Oct. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 688,394, Jan. 2, 1985, Pat. No. 4,619,149. This application Dec. 13, 1988, Ser. No. 285,322

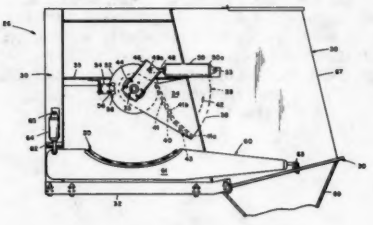
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.[4] G01N *1/12*

U.S. Cl. 73—863.91 **14 Claims**

1. A combination comprising a belt conveyor having a conveyor belt for conveying bulk material disposed thereon and drive means for driving the belt, the belt being supported for longitudinal movement in a trough-like configuration on rolling support means such that the belt has an angular, substantially non-arcuate cross-section, sampler means movable through an arcuate path across the belt for removing a cross-section increment of bulk material therefrom, and contour means for modulating the normal troughing of the belt to support and conform the cross-section of the belt to the arcuate path of said sampler means so that said sampler means moves in close proximity to the upper surface of the modulated belt and removes the cross-stream increment from the belt as the sampler means moves through its arcuate path across the belt, said contour means being support for movement from a retracted position in which said belt is substantially unmodulated to a supporting position in which said belt is modulated as aforesaid, and means for moving said contour means from said retracted position to said supporting position when said sampler means moves across said belt to accomplish removal of the cross stream increment.

14. A combination comprising a belt conveyor having a conveyor belt for conveying bulk material disposed thereon and drive means for driving the belt, the belt being supported for longitudinal movement in a trough-like configuration on rolling support means such that the belt has an angular, substantially non-arcuate cross-section, sampler means movable through an arcuate path across the belt for removing a cross-section increment of bulk material therefrom, contour means for modulating the normal troughing of the belt to support and conform the cross-section of the belt to the arcuate path of said sampler means so that said sampler means moves in close proximity to the upper surface of the modulated belt and removes the cross-stream increment from the belt as the sampler means moves through its arcuate path across the belt, said contour means being supported for movement from a retracted position in which said belt is substantially unmodulated to a supporting position in which said belt is modulated as aforesaid, and means for moving said contour means from said



retracted position to said supporting position when said sampler means moves across said belt to accomplish removal of the cross stream increment, said sample means including a sample sweep mounted for rotation about a rotative axis with a pair of cranks on the rotative axis attached to the sweep, the cranks being angularly displaced from one another and having a double acting pneumatic cylinder operatively connected to each crank, valve means for alternately pressurizing and venting chambers of each double acting pneumatic cylinder, said sweep being adapted to pass through the bulk material on said belt as said sweep is rotated about said rotative axis to remove the cross-section increment from the modulated belt, and sequencing means for controlling and rotating the sweep comprising means for pressurizing a selected chamber of each cylinder to provide balancing forces to hold said sweep in a predetermined ready position, thereafter alternately pressurizing and venting selected chambers of said cylinders to provide forces to rotate said sweep through a 360° arc which passes through the bulk material on said belt, after said sweep has passed through the body of material, pressurizing a selected chamber in one of said cylinders momentarily to oppose the force of the chamber in the other cylinder to decelerate said sweep and eject material from said sweep, and thereafter pressurizing selected chambers in said cylinders to return said sweep to the ready position.

4,884,463

TESTING APPARATUS

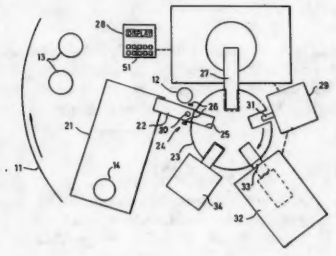
Joseph B. Kay, Berkshire, Great Britain, assignor to Microspan Process Controls Limited, Great Britain

Continuation-in-part of Ser. No. 42,942, May 18, 1987, abandoned. This application Apr. 5, 1988, Ser. No. 177,683

Claims priority, application United Kingdom, Jul. 19, 1985, 8518305

Int. Cl.[4] G01B *5/06*

U.S. Cl. 73—865.8 **8 Claims**



1. Apparatus for measuring the thickness dimension of an article having thickness and radial dimensions, the apparatus comprising:

a sensor arranged to be moved along said thickness dimension to contact the article;

means for centering the article under said sensor, said centering means including:

(a) weighing means for weighing the article and for producing a measured weight signal thereof; and

(b) calculating means for calculating a radial dimension for said article on the basis of said measured weight and a standard thickness associated with said article;

said centering means being responsive to said calculated radial dimension to move and center said article under said sensor; and

means for measuring the position of said sensor when in contact with the article and producing an output indicative of said thickness dimension.

4,884,464

DRIVING DEVICE FOR EXTENDING AND WITHDRAWING OPERATIVE MEMBERS OF A SPACE VEHICLE

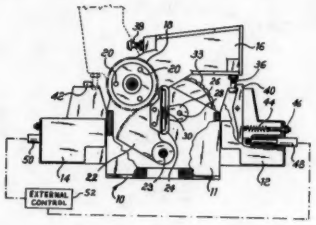
Maurizuo Grattarola, and Domenico Stella, both of Rome, Italy, assignors to Contraves Italiana S.p.A., Rome, Italy

Filed Jun. 10, 1988, Ser. No. 205,118

Claims priority, application Italy, Sep. 29, 1987, 22056 A/87

Int. Cl.[4] F16H *21/40*

U.S. Cl. 74—50 **3 Claims**



1. A driving device for extending and withdrawing operative members of a space vehicle, having a main housing (10) and at least a rotatable, member-carrying arm (16) pivoted on the housing for movement between a rest position and a work position, comprising:

(a) a rotary shaft (28) journaled in the housing and drivable by wound spring means (34) for continuous rotary movement;

(b) a link mechanism (18, 22, 24, 26, 30) connecting said rotary shaft to said arm, for transforming the continuous movement of the shaft into a reciprocating, partial rotation of the arm;

(c) a first and a second locking units (12, 14) mounted stationarily with respect to the housing, each comprising a spring-biased pawl (40, 42) to engage the arm when it reaches said rest position and said work position, respectively, and each being releasable by an external control.

4,884,465

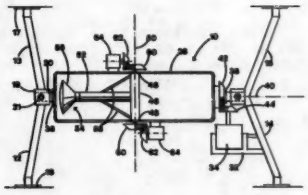
DEVICE FOR OBTAINING A DIRECTIONAL CENTRIFUGAL FORCE

George J. Zachystal, 844 Robinson St., Regina, Saskatchewan, Canada (S4T 2M3)

Filed Jan. 11, 1988, Ser. No. 142,446

Int. Cl.[4] F16H *33/20*

U.S. Cl. 74—84 R **6 Claims**



1. A device for obtaining a directional force from a rotary motion, comprising:

support means;

a frame;

means mounting the frame on the support means for rotation about a first axis;

first motor means mounted on the support means and operatively connected to the frame for rotating said frame about the first axis at a selected angular speed;

a shaft extending along a second axis perpendicular to the first axis;

bearings mounting the shaft for rotation on the frame;

a weight comprising a mass and an elongate arm extending from the mass to the shaft, the arm being secured to the shaft and being perpendicular to the second axis;

second motor means comprising two motors mounted on the frame and connected to opposite ends of the shaft for rotating said weight with respect to said frame about the second axis at said selected angular speed.

4,884,466

SCREW WITH RECIRCULATED SATELLITE ROLLERS

Bernard Duruisseau, Le Genevois, 74160 St. Julien en Genevois, France

Filed Dec. 15, 1987, Ser. No. 133,293

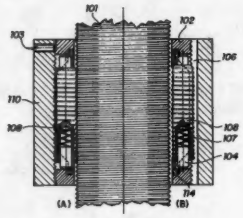
Claims priority, application Switzerland, Dec. 23, 1986, 5156/86-4

Int. Cl.[4] F16H *1/18*

U.S. Cl. 74—424.8 C **23 Claims**

1. A device for providing rotation and longitudinal displacement of a screw comprising a threaded nut; a threaded screw centrally positioned within said nut by a set of rollers, said screw having a circumference and said set of rollers being

arranged around said circumference; at least one clearance space for the recirculation of said rollers; a cap attached to each end of the nut leaving a free passage for said screw but retaining each of the rollers in said set of rollers inside the nut; and elastic means associated with the rollers for returning each



roller to a substantially central position in the nut when the roller is positioned in said at least one clearance space, wherein the returning is caused by a force of the elastic means which builds during translation of each roller toward one of said caps while the roller is positioned out of said at least one clearance space.

4,884,467

CABLE CONTROL WITH SEAL

David R. Martell, Manchester, Mich., assignor to Babcock Industries Inc., Fairfield, Conn.

Filed Dec. 5, 1988, Ser. No. 279,953

Int. Cl.[4] F16C *1/10*

U.S. Cl. 74—501.5 R **12 Claims**

1. A cable control system comprising a tubular member,
a strand rod extending through the tubular member and adapted to be moved longitudinally and laterally thereof, a sealing member mounted on the tubular member,
said sealing member including an outer circumferential wall spaced from and extending axially outwardly relative to the tubular member and an integral inner annular sealing lip surrounded by the axially outwardly extending wall, said integral annular sealing lip extending radially inwardly and axially outwardly relative to said wall and having a free edge sealingly engaging the strand rod.

4,884,468

CONTROL CABLE CONNECTING DEVICE

Tadao Muramatsu; Shigeru Hoshino, both of Toyota; Kenichi Suzuki, Nagoya, and Shinichi Yamamuro, Toyoake, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Chuo Hatsujo Kabushiki Kaisha, both of Aichi, Japan

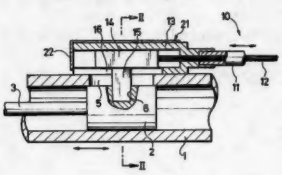
Filed Feb. 17, 1989, Ser. No. 311,958

Claims priority, application Japan, Feb. 18, 1988, 62-20334[U]

Int. Cl.[4] E16C *1/10*

U.S. Cl. 74—502.4 **2 Claims**

1. A control cable connecting device comprising:
a guide sleeve provided with a slot;
an operating member slidably fitted within the guide sleeve and provided with a hole in the circumference thereof;
a guide block fixedly connected to an extremity of an outer casing of a control cable having a cable sheathed in the outer casing, provided with a longitudinal slit in a bottom wall thereof, and fastened to an outer surface of the guide sleeve so that the longitudinal slit extend in parallel to an axis of the guide sleeve; and



a driving member slidably fitted in the guide block, provided with a projection projecting through the longitudinal slit of the guide block and the slot of the guide sleeve, and engaging the hole of the operating member.

4,884,469

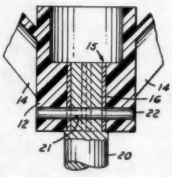
STEERING WHEEL

R. Alexander Wrigley, Detroit, Mich., assignor to Detroit Marine Engineering Corporation, Detroit, Mich.

Filed Apr. 28, 1989, Ser. No. 344,662

Int. Cl.[4] B62D *1/04*

U.S. Cl. 74—552 **4 Claims**



1. A steering wheel comprising
one-piece plastic body including a hub portion,
an annular rim portion and a plurality of spokes extending from the hub portion to the rim portion,
a sheet metal insert molded in situ in the hub portion to define an opening for a steering shaft,
said metal insert including a central generally circular portion and flattened free ends which abut one another and extend radially outwardly of the hub portion and are embedded in said hub portion.

4,884,470

POWER TRANSMISSION APPARATUS

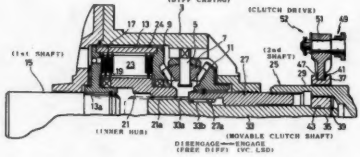
Toshinobu Onoue, Tochigi, Japan, assignor to Tochigifujisangyo Kabushiki Kaisha, Tochigi, Japan

Filed Dec. 13, 1988, Ser. No. 283,799

Claims priority, application Japan, Dec. 15, 1987, 62-189493[U]

Int. Cl.[4] F16H *1/44*

U.S. Cl. 74—710.5 **5 Claims**



1. A power transmission apparatus for transmitting a rota-

tional power to a first output shaft and a second output shaft via a differential gear composed of a differential gear casing to which the rotational power is applied, a pinion gear rotatably supported by the differential gear casing, a first side gear in mesh with the pinion gear and a second side gear formed in the second output shaft and in mesh with the pinion gear, which comprises;

(a) viscous coupling means including:

(1) a coupling case fixed to the first output shaft and in mesh with the first side gear;

(2) a plurality of first resistance plates fixed to an inner circumference of said coupling case at axial regular intervals;

(3) an inner hub disposed around said first output shaft rotatably relative to said coupling case; and

(4) a plurality of second resistance plates fixed to an outer circumference of said inner hub at axial regular intervals alternately with said first resistance plates, a working chamber filled with a viscous fluid being formed by said coupling case and said inner hub;

(b) clutch means for selectively engaging the second output shaft to said inner hub to realize a viscous coupling limit slip differential mode and disengaging the second output shaft from said inner hub to realize a free differential mode; and

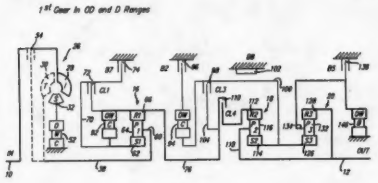
(c) clutch drive means for selectively driving said clutch means.

4,884,471

FOUR SPEED RATIO AUTOMATIC POWER TRANSMISSION

Walter E. Daggett, Union Lake, and Stanley J. Zaracki, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 23, 1988, Ser. No. 210,536
Int. Cl.[4] F16H *57/10*
U.S. Cl. 74—758 **4 Claims**



1. A multiple speed power transmission comprising:

a power input shaft, a power output shaft and an intermediate shaft located between the input shaft and the output shaft, each shaft being coaxially aligned;

first, second and third planetary gear units, each unit having a ring gear, a sun gear, a carrier and planet pinions mounted on the carrier in neshing engagement with the sun gear and ring gear, the gear units being axially aligned a torque output element of the first gear unit being connected directly to the intermediate shaft, the sun gears of the second and third gear units being connected together, the carrier of the second gear unit and the ring gear of the third gear unit being connected to the output shaft;

overdrive brake means for holding against rotation and releasing a reaction member of the first gear unit;

coast clutch means for driveably connecting and releasing the sun gear and ring gear of the first gear unit;

direct clutch means for driveably connecting and releasing the intermediate shaft and the sun gears of the second and third gear units;

band brake means for holding against rotation the sun gears of the second and third gear units;

forward clutch means for driveably connecting and releasing the intermediate shaft and the ring gear of the second gear unit during operation in each forward speed ratio;

low-reverse brake means for selectively holding against rotation the carrier of the third gear unit;

intermediate brake means for holding against rotation an element connected to the intermediate brake means;

a first overrunning clutch for driveably connecting in one direction only the sun gear and ring gear of the first gear unit;

an overrunning brake holding against rotation in one direction only the carrier of the third gear unit;

a second overrunning clutch connected to the intermediate brake means, driveably connecting in one direction only the sun gear of the second gear unit and intermediate brake means;

the first overrunning clutch and the coast clutch are arranged in parallel drive relationship between the first gear unit and the overdrive brake means;

the first overrunning clutch connects the sun gear and the ring gear of the first gear unit during operation in first, second and third forward drive speeds to which the transmission makes automatic shifts;

the overdrive brake means holds the sun gear of the first gear unit, and the first overrunning clutch overruns during operation in a fourth forward speed to which the transmission makes automatic shifts; and

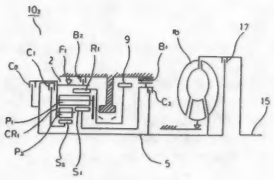
the coast clutch means connects the sun gear and ring gear of the first gear unit and the first overrunning clutch overruns during operation in first, second and third forward speeds selected manually.

4,884,472

AUTOMATIC TRANSMISSION

Masakatsu Miura, Kariya, and Mashiko Ando, Okazaki, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Dec. 1, 1987, Ser. No. 127,354
Claims priority, application Japan, Dec. 9, 1986, 61-293664
Int. Cl.[4] F16H *57/10*
U.S. Cl. 74—763 **4 Claims**



1. An automatic transmission having four forward speed automatic transmission mechanism, comprising,

an input shaft,

a planetary gear unit having first and second sun gears, a long pinion meshing said first sun gear, a short pinion meshing said long pinion and said second sun gear, a carrier for supporting said long pinion and said short pinion, and a ring gear meshing said long pinion,

a clutch mechanism having a first clutch for connection the input shaft to the second sun gear, said first clutch being located axially outwardly of said automatic transmission mechanism, said first clutch having a hydraulic actuator and a flange with a hub, said flange operating to connect the first clutch to the input shaft and constituting the hydraulic actuator for the first clutch, a second clutch for connecting the input shaft to the first sun gear, a third clutch for connecting the input shaft to the carrier and having a hydraulic actuator, a flange, a tubular member for the hydraulic actuator, and friction plates situated between the flange of the third clutch and the hub of the first clutch, said third clutch being located axially outside

the first clutch, and a drum situated outside the third clutch, said drum being fixed to the flange of the third clutch at one end and to the carrier at the other end,

an output member connected to the ring gear, said output member being situated in the center of the automatic transmission mechanism so that the output member encloses the input shaft,

restraining means for restraining the first sun gear and carrier, and

a transmission case for covering the transmission mechanism and having a main case with a rear portion, and a rear cover for covering the rear portion, said third clutch being covered by the rear cover, said rear cover having an inner extrusion extending toward the inside of the transmission mechanism coaxially with the input shaft, said inner extrusion rotationally supporting the flange and the tubular member for the hydraulic actuator of the third clutch.

4,884,473

DUAL EPICYCLIC SPEED CHANGER

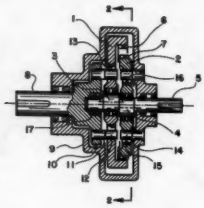
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 12,679, Feb. 9, 1987, Pat. No. 4,841,810, and a continuation-in-part of Ser. No. 29,521, Mar. 23, 1987, Pat. No. 4,762,025. This application Feb. 9, 1988, Ser. No. 153,961

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[4] F16H *1/28*

U.S. Cl. 74—804 **14 Claims**



1. A mechanical speed changer comprising in combination :

(a) frame;

(b) a power output member of generally axisymmetric construction rotatably supported by the frame;

(c) a shaft disposed in line with the power output member and rotatably supported by the frame; said shaft including a first and second eccentric section disposed in two generally opposing eccentric arrangements;

(d) a first rotary member with a first set of meshing elements rotatably mounted on said first eccentric section of the shaft, wherein said first set of meshing elements is disposed in a concentric arrangement about the central axis of said first eccentric section of the shaft, and a plurality of circular holes with central axis parallel to the shaft disposed on a circle concentric to the central axis of said first eccentric section of the shaft;

(e) a second rotary member with a second set of meshing elements rotatably mounted on said second eccentric section of the shaft, wherein said second set of meshing elements is disposed in a concentric arrangement about the central axis of said second eccentric section of the shaft, and a plurality of circular holes with central axis parallel to the shaft disposed on a circle concentric to the central axis of said second eccentric section of the shaft; wherein, said first and second sets of meshing elements engage each other over a portion of said concentric arrangement;

(f) a plurality of circular cylindrical posts disposed on a circle concentric to the central axis of the shaft and rigidly affixed to a member nonrotatably secured to the power output member and respectively engaging the plurality of circular holes included in one of the first and second rotary members in a clearance relationship allowing orbiting motion of said one of the first and second rotary members about the central axis of the shaft, wherein the combination of the circular holes and the circular cylindrical posts provides a coupling that transmits rotating motion of said one of the first and second rotary members created by the orbiting motion thereof to the power output member; and

(g) a plurality of circular cylindrical posts disposed on a circle concentric to the central axis of the shaft and rigidly affixed to a holder member supported by the frame and respectively engaging the plurality of circular holes included in the other of the first and second rotary members in a clearance relationship allowing orbiting motion of said the other of the first and second rotary member about the central axis of the shaft, wherein the combination of the circular holes and the circular cylindrical posts provides a coupling that disallows rotating motion of said the other of the first and second rotary member relative to said holder member.

4,884,474

DEVICE FOR INDEXING

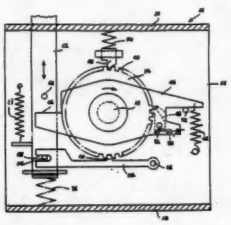
Yasuyuki Kawata, Kyoto, Japan, assignor to Kawata Chuck Manufacturing Co. Ltd., Kyoto, Japan

Filed Jun. 2, 1987, Ser. No. 57,340

Claims priority, application Japan, Aug. 2, 1986, 61-182338

Int. Cl.[4] B23B *29/24*

U.S. Cl. 74—813 L **1 Claim**



1. An NC milling machine for indexing a work comprising an indexing plate connected to an actuating axis of an indexing table holding a work in position by a crank member having an engaged groove at a tip thereof and a crank pin, a push bar for moving linearly relative to a base of the device, and an actuating means for engaging in the push bar and rotating the indexing plate at fixed angles, said actuating means including a rotating plate mounted rotatably to the actuating axis relative to said indexing plate, an engaged portion provided in said rotating plate and engaging said push bar and a claw member attached to said rotating plate and engaged in an engaging claw, said crank pin engaged in a central portion of said engaging claw, said NC milling machine being so constructed to index the work such that the actuating means rotates the indexing plate at fixed angles in accordance with a linear action of the push bar, the push bar being interlocked with an extra action other than the normal action of a tool of a cutting device of a machining center.

4,884,475

AUTOMOTIVE DRIVE SYSTEM FOR MACHINES AND VEHICLES

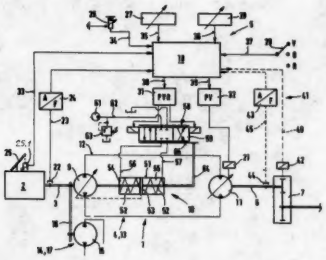
Winfried Walzer, Elchingen, and Wolfgang Reistle, Hövelsingen, both of Fed. Rep. of Germany, assignors to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed Mar. 29, 1988, Ser. No. 174,845

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800893

Int. Cl.[4] B60K 41/16

U.S. Cl. 74—862 14 Claims



1. An automotive drive system for machines and vehicles, in particular a drive system for moving construction vehicles such as excavators, wheel loaders and caterpillar vehicles comprising a driving motor the speed of which can be continuously changed by means of a control member and a converter having control means for controlling the output speed of said converter in dependence on a depression of the speed of the driving motor determined by means of signal transmitters, wherein, if the driving motor speed resulting during operation of the drive system is greater than the driving motor speed given by a predetermined speed depression, the converter is controlled to minimum transmission ratio independently of the driving motor speed, and on reaching the predetermined speed depression the converter is controlled in dependence on the driving motor speed so that the driving motor speed does not fall below a controlling characteristic curve corresponding to the predetermined speed depression.

4,884,476

METHOD FOR THE PREPARATION OF A DIAMOND-CLAD MACHINING TOOL

Fuminori Okuzumi, Tokyo, and Junichi Matsuda, Yokohama, both of Japan, assignors to Asahi Diamond Industrial Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1988, Ser. No. 206,228

Claims priority, application Japan, Dec. 10, 1987, 62-312985

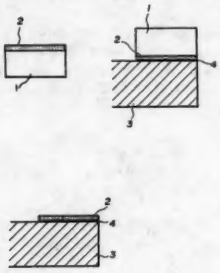
Int. Cl.[4] B23B 27/20, 27/18

U.S. Cl. 76—101 R 15 Claims

1. A method for the preparation of a machine tool having a cladding layer of diamond formed by the method of vapor-phase deposition which comprises the steps of:

(a) forming a film of diamond having a thickness of from 10 to 1000 μm by vapor-phase deposition on the surface of a temporary substrate;

(b) bonding the film of diamond as borne by the temporary substrate by brazing the surface of the diamond film with a brazing material to the surface of a base body of a machine tool; and



(c) removing the temporary substrate from the film of diamond bonded to the surface of the base body of the machine tool with a brazing layer therebetween.

4,884,477

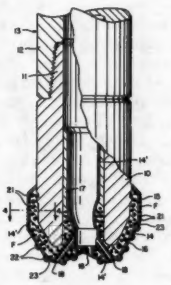
ROTARY DRILL BIT WITH ABRASION AND EROSION RESISTANT FACING

Redd H. Smith, Salt Lake City, and Craig H. Cooley, Bountiful, both of Utah, assignors to Eastman Christensen Company, Salt Lake City, Utah

Filed Mar. 31, 1988, Ser. No. 175,926

Int. Cl.[4] B22F 7/04

U.S. Cl. 76—108 A 41 Claims



1. A process for the production of a rotary drill bit matrix coated with a hardfacing layer comprising the steps of:

(a) forming a hollow mold for molding at least a portion of the drill bit;

(b) providing one or more displacement elements corresponding to features to be formed on and within the bit;

(c) applying adhesive and hardfacing material to the interior surfaces of said mold and the exterior surfaces of said displacement elements, said adhesive being effective to hold said hardfacing material in place;

(d) positioning a bit blank at least partially within said mold;

(e) packing said mold with a filler material;

(f) infiltrating said filler material and said hardfacing material on said mold and displacement element with a binder in a furnace to form said bit; and

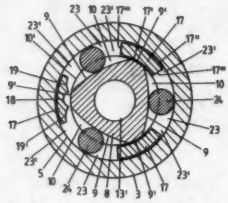
(g) removing said displacement elements to form said features having a coating of said hardfacing material on the surfaces thereof.

4,884,478

SCREW TOOL

Karl Lieser, Wuppertal, Fed. Rep. of Germany, assignor to Wera Werk Hermann Werner GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Sep. 17, 1987, Ser. No. 98,374
Claims priority, application European Pat. Off., Oct. 16, 1986, 86114308.9; Fed. Rep. of Germany, Feb. 21, 1987, 3705663
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—59.1 15 Claims



1. In a screw tool with direction-reversible catch, the tool comprising an outer drive ring part, and an inner driven core part of approximately triangular cross section;

a rotatable switch member having a plurality of drivers extending therefrom and arranged circumferentially around said core part;

clamping members in wedge-shaped clamping spaces between said outer drive ring part and said inner driven core part, which clamping members are displaceable by said rotatable switch member which is lockable in its switch positions, each of said wedge-shaped clamping spaces having two clamping positions at opposite ends of a clamping space for receiving and clamping one of the clamping members; and wherein said drivers act on the clamping members and block passage of the clamping members into respectively one of their two clamping positions and wherein;

in two switch positions of the switch member, each of said clamping members is loosely disposed in a separate of said clamping spaces and is displaceable into a clamping position therein exclusively by rotation of the drive ring part;

in a central switch position of said switch member, each of said clamping bodies is located substantially centrally to a corresponding side of said driven core part;

vertices of said core part are arranged concentrically about said core part to separate said clamping spaces, said drivers being located at respective ones of said vertices and being translatable in circumferential direction relative to said vertices upon rotation of said switch member about said core part; and

said drivers extend in circumferential direction into said clamping spaces to limit movement of said clamping members in said clamping spaces to a predetermined region of unobstructed movement, a circumferentiakl length of said predetermined region of unobstructed movement being approximately equal to a circumferential length of a driver.

4,884,479

WRENCH WITH RACK AND SEGMENT GEAR LINKAGE

Thomas J. Mazzone, 4016 Audubon Dr., Largo, Fla. 34641

Continuation of Ser. No. 184,270, Apr. 21, 1988, Pat. No. 4,797,965. This application Jul. 5, 1988, Ser. No. 215,242
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[4] B25B *13/12*
U.S. Cl. 81—128 24 Claims

1. A wrench having a handle member comprising:

a handle member having a fixed position jaw means formed on its proximal end;

a pivot member arm having a movable jaw means formed on its proximal end;

a pivot point where said handle member and pivot arm member are pivotally connected to one another;

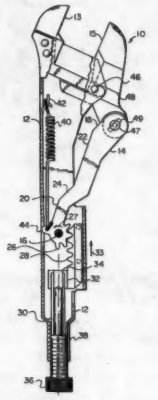
a segment gear member integral with said pivot arm;

a crank member integral with said pivot arm;

a rack gear member that is slideably mounted with respect to said handle member;

said rack gear member having a distal position and a proximal position and a plurality of positions therebetween;

said rack gear member being meshingly engaged with said



segment gear member, said segment gear member being constrained to rotate when said rack gear member travels between its distal and proximal positions;

a bias means having a power sufficient to cause said jaw members to separate from one another, which movement effects sliding travel of said rack gear member in a proximal-to-distal direction;

said segment gear having an axis of rotation coincident with said pivot point so that pivoting of said pivot arm member under the influence of said bias means effects simultaneous and corresponding rotation of said segment gear;

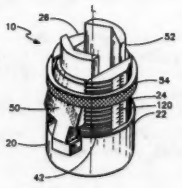
and means for overcoming the bias provided by said bias means so that when said jaw members are closed, the power of said bias means is inadequate to separate them.

4,884,480

ADJUSTABLE SOCKET DEVICE

Tim K. Briese, 18185 Boughs Pl., Colorado Springs, Colo. 80908

Filed Jul. 2, 1987, Ser. No. 69,252
Int. Cl.[4] B25B *13/18*
U.S. Cl. 81—128 31 Claims



1. An adjustable socket operative to rotatably drive a nut structure and adapted to be selectively adjustable to accommodate different sizes of nut structures, comprising:

a socket body including a head portion and first and second wing portions longitudinally projecting from a first side of said head portion on opposite sides of a longitudinal axis through said socket body and having threaded exterior surfaces formed on a common cylinder about said axis, said first and second wing portions separated from one another by a channel region extending diametrically through said socket body and respectively provided with first and second interior surfaces facing each other in opposed relation to define a slideway region therebetween;

first and second jaw members slideably mounted in said channel region for transverse reciprocal movement in said socket body, each jaw member including a slide element slideably received in said channel region and a jaw element rigidly supported by a respective slide element and projecting longitudinally of said socket body, each jaw element configured with a width defined by opposite longitudinal sidewall portions to extend between and be slideably supported by said sidewall portions which respectively abut said interior surfaces, each jaw element having a longitudinal outer surface facing laterally outwardly of said channel region and formed as a cam surface oriented at a cam angle with respect to a transverse axis perpendicular to the longitudinal axis, and a longitudinal inner surface defining a work face adapted to engage said nut structure, said work faces oriented in opposed facing relation to one another and away from one another as said first and second jaw members are reciprocally moved in said socket body;

biasing means for biasing said jaw members apart from one another to expand the space between said work surfaces; and

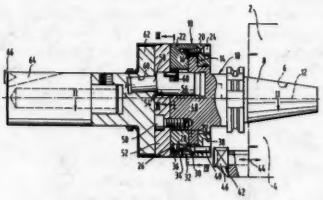
constraining means including a collar threadably received on said wing portions and movable longitudinally of said socket body to engage said cam surfaces to selectively vary the maximum degree of expansion between the work surfaces.

4,884,481

RADIALLY ADJUSTABLE TOOL

Walter Strauss, Munich, Fed. Rep. of Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 22, 1988, Ser. No. 146,833
Int. Cl.[4] B23B *41/00*
U.S. Cl. 82—1.2 **10 Claims**



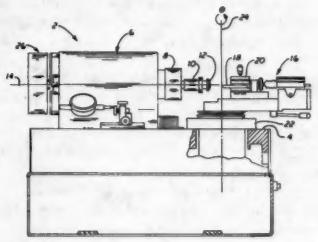
1. A device for effecting a radial adjusting of a cutting edge member of a boring and turning tool, comprising: a tool-carrier housing insertable into a spindle rotatably supported in a spindle housing of a machine tool, a cross slide carrying said cutting edge member and being supported for movement on said tool-carrier housing transversely with respect to the direction of a spindle axis an adjusting ring supported rotatably on the outside of said tool-carrier housing and coaxially with respect to the direction of said spindle axis, which adjusting ring is coupled with said cross slide through a transmission gear arranged in said tool-carrier housing, locking means for locking said adjusting ring relative to said tool-carrier housing which rotates with said spindle, said locking means including an extendable and retractable locking ram on said spindle housing, said locking ram, in its extended position, being lockingly engagable with said adjusting ring, and a locking member arranged on said adjusting ring, said locking member being adjustable between a locking position locking said adjusting ring to said tool-carrier housing and an unlocking position releasing said adjusting ring, a restoring means for continually urging said locking means toward said locking position, said locking ram operatively engaging said locking member, such that said locking member is, during an extending of said locking ram, movable by said locking ram against the force of said restoring means into its unlocking position.

4,884,482

METHOD AND APPARATUS FOR CUTTING AN ASPHERIC SURFACE ON A WORKPIECE

Buford W. Council, Jr., Ruskin, Fla., assignor to Citycrown, Inc., Tampa, Fla.

Filed Nov. 22, 1988, Ser. No. 276,230
Int. Cl.[4] B23B *5/36/1/00*
U.S. Cl. 82—1.11 **17 Claims**



9. A method of forming an aspheric surface on a workpiece, comprising the steps of

mounting a workpiece to a workpiece holder that is rotatably carried by the spindle, headstock and bed of a lathe;

rotating said spindle, said workpiece holder and said workpiece about the axis of rotation of said spindle;

engaging a surface of said workpiece with a forming tool and moving said forming tool through an arcuate path about an axis that is fixed relative to said lathe bed during said engagement and is generally transverse to said spindle axis;

determining the time-varying angular position of said forming tool along said arcuate path;

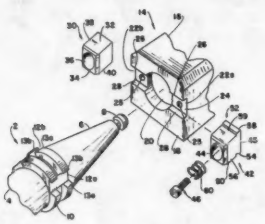
determining the time-varying angular position of a point on said workpiece about said spindle axis;

reciprocating said workpiece holder and said workpiece held thereby relative to said lathe headstock and to said forming tool in synchronization with said movement of said forming tool and with said rotation of said workpiece about said spindle axis such that said synchronized reciprocation of said workpiece during said forming tool engagement and movement effects forming of a contoured surface having different radii of curvature on said workpiece.

4,884,483
DEVICE FOR LOCKING A TOOL HOLDER TO A TOOL BLOCK

Walter H. Kelm, Mt. Clemens, and Paul W. Newland, Warren, both of Mich., assignors to Carboloy Inc., Warren, Mich.

Filed Mar. 17, 1988, Ser. No. 169,286
Int. Cl.[4] B23B *29/00*
U.S. Cl. 82—160 12 Claims



1. A tool assembly comprising:

(a) a tool holder comprising a cutting insert assembly at one end, and another end adapted to be inserted into a tool block, and at least one pair of opposed first and second slots on the outer surface of the tool holder between said ends, each of said tool holder slots having at least two wall portions;

(b) a tool block having one end for receiving said another end of the tool holder and at least one pair of opposed first and second slots alignable with the tool holder slots to form at least one first and second pairs of aligned slots when the tool holder is operatively inserted and secured into the tool block;

(c) first securing means insertable into at least one of said first pair of aligned slots having a wall for engaging a corresponding wall of the first tool holder slot in which the first securing means is inserted, wherein the centerline of said secured tool holder and tool block extends through the center of said first securing means; and

(d) second securing means having at least one side surface insertable into at least one of said second pair of aligned slots wherein at least a portion of said side surface engages at least one of said tool holder slot wall portions to exert pressure tangentially against said wall portion of the second tool holder slot in which the second securing means is inserted when the tool holder is operatively secured to the tool block to thereby force the tool holder to rotate until the wall of the first securing means engages the corresponding wall of the first tool holder slot in which the first securing means is inserted.

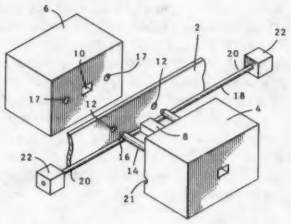
4,884,484
STRIP RETAINER AND STRIPPER FOR STAMPING AND FORMING MACHINE

Johannes C. W. Bakermans, Harrisburg, and Dimitry G. Grabbe, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 19, 1988, Ser. No. 221,964
Int. Cl.[4] B21D *45/06*
U.S. Cl. 83—145 8 Claims

1. A machine for punching holes in strip material, the machine comprising strip feeding means for feeding strip material along a strip feed path which extends through an operating zone, a punch assembly and a die assembly in the operating zone on opposite sides of the strip feed path, the punch and die assemblies being in opposed confronting relationship and being movable relatively towards and away from each other along a punch and die assembly path of reciprocation between an open position, in which the punch and die assemblies are remote from each other, and a closed position, in which the punch and die assemblies are proximate to each other, the punch assembly having punch means thereon and the die assembly having die opening means which is dimensioned to receive the punch means, the punch means being movable relatively towards, and into, the die opening means along a punch means path of reciprocation when the punch and die assemblies move from their open positions to their closed positions thereby to punch at least one hole in the strip material, the punch assembly having pilot pin means ex tending therefrom and the strip material having pilot hold means which are dimensioned to receive the pilot pin means thereby precisely to position the strip material in the operating zone prior to the arrival of the punch assembly and the die assembly at their closed positions, the pilot pins means being reciprocable along a pilot pin path of reciprocation, the machine being characterized in that:

a strip retainer is provided for stripping the strip material from the pilot pin means when the punch assembly and the



die assembly move from their closed positions to their open positions, the strip retainer comprising at least one static member which is beside, and adjacent to, the strip feed path, the static member being between the punch assembly and the strip feed path and intersecting the punch and die assembly path of reciprocation, the strip retainer being in non-intersecting relationship with the punch means path of reciprocation and with the pilot pin path of reciprocation,

the strip retainer comprising a wire which extends laterally beyond the punch and die path of reciprocation on two opposite sides thereof and having retainer ends which are secured to fixed securing means, whereby

during each operating cycle, the pilot pin means moves into the pilot hole means in the strip material, and during subsequent movement of the punch assembly to its open position, the strip retainer restrains the strip material from being carried with the pilot pin means laterally of the strip feed path and thereby strips the strip material from the pilot pin means.

4,884,485
PLATE CUTTING DEVICE CAPABLE OF BEING USED TO CUT A PLATE ALONG A CURVE

Lucky Cho, P.O. Box 45-25, Taichung, Taiwan

Filed Mar. 30, 1989, Ser. No. 330,817
Int. Cl.[4] B23D *19/08*
U.S. Cl. 83—473 6 Claims

1. A plate cutting device capable of being used to cut a plate along a curve comprising;

a body portion, comprising;

a square base;

a body support mounted on said square base;

a slant support mounted on said square base;

a U-shaped platform mounted on said body support;

a smoothly curved frame extending from one arm of said U-shaped platform;

and a rolling wheel supporting barrel attached to one end of said smoothly curved frame;

a rolling wheel means connected to said rolling wheel supporting barrel comprising;

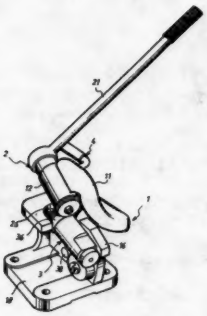
a rolling wheel connected to one end of said rolling wheel supporting barrel; and

a ratchet rotating lever means connected to said rolling wheel through the other end of said wheel supporting barrel;

a cutting wheel means secured to the said slant support comprising;

a cutting wheel supporting barrel;

a cutting wheel connected to said cutting wheel supporting barrel;



an eccentricity adjustable bolt connecting said cutting wheel supporting barrel to said slant support;

said eccentricity adjustable bolt adjusting the vertical and horizontal positions of said cutting wheel means; and a supporting bolt threaded into said slant support below and supporting said cutting wheel support barrel;

a bent stop bar secured to said smoothly curved frame; and

wherein said plate cutting device is capable of cutting plates of various shapes, thickness and sizes along straight or curved lines.

4,884,486

ELECTRONIC SCRATCH FILTER FOR BOWED INSTRUMENTS

Richard E. D. McClish, 1739 Addison suite 15, Berkeley, Calif. 94703

Continuation of Ser. No. 198,780, May 25, 1988, abandoned. This application Apr. 27, 1989, Ser. No. 344,488

Int. Cl.[4] G01H *1/12, 3/18*

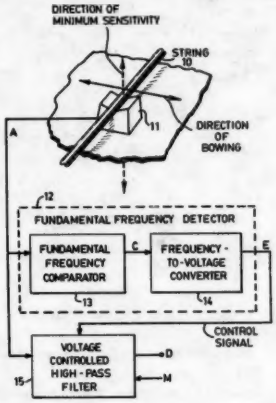
U.S. Cl. 84—736 **12 Claims**

1. A device to remove noise from a tone signal of a musical instrument, said tone signal having a plurality of vibratory components corresponding to music vibrations occurring in said instrument and also having a noise component associated with a said vibratory component, said device comprising:

frequency detecting means producing a signal indicative of the fundamental frequency of a played note in said tone signal,

high-pass filter means having a variable frequency-response determined by a cutoff frequency which changes in response to a control signal, and producing a filtered tone signal in response to said tone signal, and

means to control said cutoff frequency of said high-pass filter means with said signal indicative of said fundamental frequency of said played note, whereby said noise component of said tone signal is selectively reduced in said filtered tone signal and whereby said vibratory components of said tone signal are not substantially altered with respect to one another in said filtered tone signal by action



of said high-pas filter means, irrespectively of a change in said fundamental frequency of said played note.

4,884,487

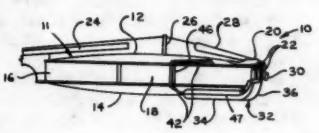
SHOULDER PAD FOR STRING INSTRUMENTS OF THE VIOLIN AND VIOLA TYPE

Valerie K. Feldkamp, 916 Stone, Louisville, Ky. 40217

Filed Jan. 5, 1989, Ser. No. 293,625

Int. Cl.[4] G10D *3/18*

U.S. Cl. 84—280 **10 Claims**



1. A chest or shoulder pad for a musical instrument such as a violin, viola or the like of the type which includes a resonance box containing bouts on opposite sides thereof, a top surface, a bottom surface, a rib interposed between said top and bottom surfaces, a chin rest disposed over a lower end corner portion of said top surface, a screw assembly connecting said chin rest to a corresponding lower corner portion of said rib, and string accessories including a tail piece and a tail piece anchor button, said pad comprising

a flexible, resilient body portion adapted to fit the contour of said bottom surface on a lower end portion of said resonance box below said bouts,

a flexible, resilient neck portion attached to a lower corner portion of said body portion, said neck portion being adapted to extend outwardly and upwardly from said body portion to cover at least a portion of said screw assembly, and

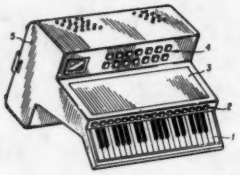
a pair of flexible straps connectable between opposite corner portions of a distal end of said neck portion and corresponding corner portions of an upper end of said body portion, said straps being adapted to extend around lower corner portions of said bouts to inhibit sliding movement of said pad on said resonance box resulting from rubbing movement of a player of said instrument against said pad.

4,884,488

SLENDER HOUSING FOR ELECTRONIC M.I.D.I. ACCORDION

Giorgio F. Curletto, 6109 Nevada Ave., NW., Washington, D.C. 20015

Filed Jan. 13, 1989, Ser. No. 297,801
Int. Cl.[4] G10D *11/00*
U.S. Cl. 84—376 R 1 Claim



1. A slender housing for an electronic M.I.D.I. accordion comprising:

a vertical back member having a first and a second longitudinal edge;

a vertically oriented bassboard housing attached to said vertical back member at said first longitudinal edge, said housing having a bassboard facing away from said back member and having a front end;

a vertically oriented keyboard having an inner edge, said inner edge having a front and back side, said keyboard being attached to said second edge of said back member at said back side of said inner edge and facing away from said back member;

a primary control panel in the shape of an elongated narrow member having a first and second longitudinal edge, said primary control panel is disposed adjacent to said keyboard and is attached to said keyboard at said front side of said inner edge of said keyboard;

a center frontal section, said section consists of a single removable panel including two longitudinal edges, said center frontal section is attached by one of its said longitudinal edges to said second longitudinal edge of said primary control panel, said frontal section merges at its other longitudinal edge with an edge of a secondary control panel, said secondary control panel includes a second edge attached to the front end of said bassboard of said bassboard housing.

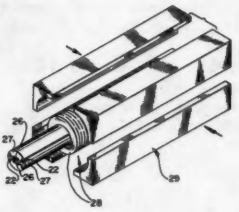
4,884,489

HIGH PERFORMANCE ELECTROMAGNETIC RAILGUN LAUNCHER

Raymond C. Zowarka; Damon A. Weeks; William F. Weldon; John H. Gully; Jim L. Upshaw; Mike L. Spann, and Dennis R. Peterson, all of Austin, Tex., assignors to Board of Regents University of Texas System, Austin, Tex.

Filed Apr. 22, 1987, Ser. No. 41,183
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 9 Claims

1. An electromagnetic railgun having a pair of parallel spaced electrically conductive projectile launching rails and an insulating structure supporting said rails and cooperating with said rails to form a bore between said rails, wherein said insulating structure comprises a pair of spaced-apart insulators on opposite sides of the bore, an insulating containment tube receiving the spaced apart insulators and the rails, and a compression frame receiving the containment tube and including means for clamping the containment tube so as to exert a compressive force engaging the rails with the insulating structure, wherein said insulating structure includes sidewall supports and said rails include flanges adjacent the containment tube which abut against stops formed in the sidewall supports.

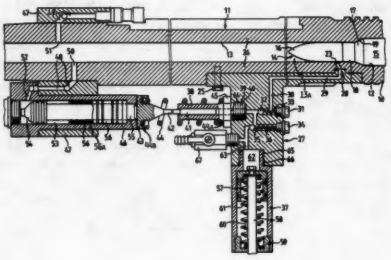


4,884,490

APPARATUS FOR COOLING THE BARREL INNER WALL OF A WEAPON BARREL OF A FIRING WEAPON

Ernst Hürlemann, Zürich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Oct. 24, 1988, Ser. No. 261,410
Claims priority, application Switzerland, Oct. 28, 1987, 04222/87
Int. Cl.[4] F41D *11/20*
U.S. Cl. 89—14.1 4 Claims



1. An apparatus for cooling an inner wall of a barrel wall of a weapon barrel of a firing weapon, comprising:

at least one cooling fluid channel for injection of a cooling fluid into the interior of the weapon barrel at a rear end portion of the weapon barrel;

means for dosing the infeed of the cooling fluid into the weapon barrel;

said at least one cooling fluid channel being located at the barrel wall of the weapon barrel and opening at the inner wall of the weapon barrel;

means for generating an injection pressure for the injection of the cooling fluid into the interior of the weapon barrel;

said injection pressure-generating means being in flow communication with the interior of the weapon barrel such that the injection pressure-generating means can be actuated by the pressure of propellant gas generated upon firing of a cartridge from the weapon barrel;

said injection pressure-generating means cooperating with the dosing means for injecting a dosed quantity of cooling fluid at a required pressure into the interior of the weapon barrel;

said injection pressure-generating means comprising piston means actuatable by the gas pressure of the propellant gas;

said dosing means comprising dosing piston means cooperat-

ing with said piston means of said injection pressure-generating means;

said dosing piston means comprising an injection piston with which a dosed quantity of the cooling fluid can be injected into the interior of the rear end portion of the weapon barrel;

said piston means of said injection pressure-generating means comprises a pressure-exerting piston acting upon said injection piston;

said two pistons possessing different diameters from one another with said pressure-exerting piston having a larger diameter than said injection piston;

said pressure-exerting piston possessing the larger diameter being impinged by propellant gas; and

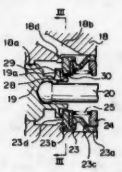
said injection piston possessing the smaller diameter being impinged by the cooling fluid.

4,884,491

PNEUMATIC BOOSTER

Mitsuhiro Endo, Ebina, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Apr. 14, 1988, Ser. No. 181,425
Claims priority, application Japan, Apr. 15, 1987, 62-92787
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—369.2 **19 Claims**



1. A pneumatic booster comprising:

a casing;

a diaphragm secured to said casing to partition the inside of said casing into a front chamber which is communicated with a negative pressure source and a rear chamber;

a valve body secured to the inner peripheral portion of said diaphragm;

a vacuum valve having a first vacuum valve portion and a second vacuum valve portion provided in said valve body and movable relative to said first vacuum valve portion for mutual engagement and disengagement for selectively communicating and cutting off said front and rear chambers from each other;

an atmospheric valve comprising a first atmospheric valve portion and a second atmospheric valve portion provided in said valve body and movable relative to said first atmospheric valve portion for mutual engagement and disengagement for selectively communicating and cutting off said rear chamber and atmosphere from each other;

an input rod for actuating said vacuum valve and said atmospheric valve; and

an output rod adapted to receive the force of displacement of said diaphragm;

said atmospheric valve further having a third atmospheric portion provided in said valve body in series with and positioned along the path of movement of said first atmospheric valve portion relative to said second atmospheric valve portion for successive engagement of said first and third atmospheric valve portions and said first and second atmospheric valve portions during relative engaging movement along said path; and

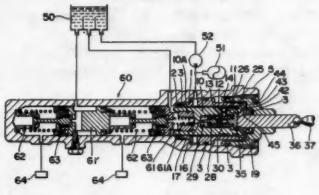
said atmospheric valve further has orifice means for providing communication between said rear chamber and the atmosphere during the period of time from the engagement between said first and third atmospheric valve portions until the engagement between said first and second atmospheric valve portions.

4,884,492

HYDRAULIC POWER BOOSTER

Toshifumi Maehara, Hanazono, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd, Saitama, both of, Japan

Filed Jun. 29, 1988, Ser. No. 213,127
Claims priority, application Japan, Jul. 13, 1987, 62-174265
Int. Cl.[4] F15B *9/10*
U.S. Cl. 91—370 **12 Claims**



1. A hydraulic booster having a power piston slidably inserted into a cylinder member and coupled to a master piston of a master cylinder, a pressure chamber disposed in the rear of said power piston, a return valve provided in such a manner as to open and close a low-pressure channel connecting said pressure chamber to a reservoir, and a supply valve provided in such a manner as to open and close a high-pressure channel connecting said pressure chamber to a high-pressure fluid source, a high-pressure fluid being introduced into said pressure chamber as said return valve is closed and said supply valve is opened, said hydraulic booster comprising:

a valve sleeve slidably inserted in said power piston and urged rearwardly of said power piston by a first spring; and

a cam portion provided on said valve sleeve and adapted to open said high-pressure channel by pressing said supply valve when said valve sleeve is advanced,

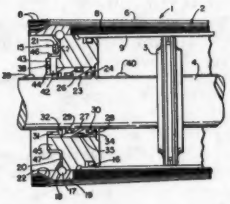
wherein said supply valve is constituted by a first ball urged by a second spring in such a manner as to close said high-pressure channel, said cam portion is provided in an outer periphery of said valve sleeve, and said high-pressure channel consists of a gap between said power piston and said outer periphery of said valve sleeve.

4,884,493

FLUID ACTUATOR INCLUDING A BALLISTICALLY TOLERANT ROD GLAND BEARING

James N. Tootle, Kalamazoo, Mich., assignor to Pneumo Abex Corporation, Boston, Mass.

Filed Jul. 1, 1988, Ser. No. 214,401
Int. Cl.[4] F01B *29/08, 7/00*; F16J *15/18*
U.S. Cl. 92—128 **23 Claims**



1. A fluid actuator comprising a cylinder housing, a piston

axially movable within said housing, a rod gland at one end of said housing, a separately formed rod gland bearing axially insertable into said rod gland, a rod extending from said piston through said rod gland bearing, and retainer means for retaining said rod gland bearing against axial movement relative to said rod gland, said retainer means including means for freeing said rod gland bearing from said rod gland upon engagement of a deformation on said rod with said rod gland bearing during axial movement of said rod in one direction for movement of said rod gland bearing with said rod to clear such deformation.

4,884,494

PRESSURE CYLINDER

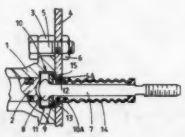
Roy Campbell, Worcestershire, and Anthony G. Price, Gwent, both of Great Britain, assignors to Lucas Industries Public Limited Company, Birmingham, England

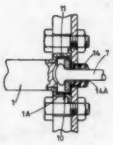
Filed Mar. 2, 1988, Ser. No. 163,034

Claims priority, application United Kingdom, Mar. 3, 1987, 8704899

Int. Cl.[4] F16J *1/10*; F01B *11/02*

U.S. Cl. 92—129 **9 Claims**





1. A pressure cylinder, comprising:

a cylinder body containing a piston in one direction by a generally coaxial force input rod; and

rod retention means carried by the cylinder, said rod retention means have a first cylinrical portion engaged within an open end of the cylinder body, a transverse wall portion providing, at one side thereof, and axially outwardly facing surface arranged such that, when the cylinder is mounted on a thick support, said axially outwardly facing surface abuts a surface of said support, and opposite side of said transverse wall portion being engageable, within the area of said axially outwardly facing surface, by means movable with the rod, whereby forces susutanied, in use, by the rod in a direction opposed to the actuating force input direction thereof are transferred by a said rod retention means onto the fixed support.

4,884,495

FLUID MOTOR ACTUATOR WITH COMPRESSION SPRING FAIL-SAFE MECHANISM

Floris J. Groeneveld, Holland, Netherlands, assignor to EL-O-MATIC-USA, Inc., Hackensack, N.J.

Filed Jun. 20, 1988, Ser. No. 209,184

Int. Cl.[4] F01G *9/04*

U.S. Cl. 92—130 C **1 Claim**

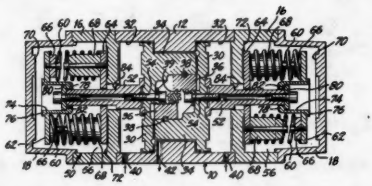
1. In an actuator in which an actuator member is moved, in response to the application of motive power, from a rest position to either one of first and second actuated positions located in opposite directions away from the rest position, the actuator including opposed motor means for driving the actuator member from the rest position toward the respective first and second actuated positions, each motor means comprising a fluid motor including a cylinder and a piston movable within the cylinder along a central longitudinal axis, and each piston reciprocating along a linear path of travel, a fail-safe mechanism for assuring that upon loss of said motive power, the actuator member is returned to and retained at the rest position, the fail-safe mechanism comprising:

a locator member associated with each motor means, each locator member comprising a longitudinally extending rod coupled with the actuator member for reciprocating movement along a linear path of travel from a rest location, corresponding to said rest position of the actuator member, to either one of first and second locations placed in opposite first and second directions away from the rest location, the first and second locations corresponding to the respective first and second actuated positions of the actuator member;

drive means coupling each rod with the actuator member for rotation of the actuator member between the rest position and either one of said first and second actuated positions in response to reciprocation of the rods;

resiliently compressible means associated with each locator member, each resiliently compressible means including at least one pair of compression springs, the compression springs of the pair being spaced laterally away from the central longitudinal axis and being located diametrically opposite one another relative to the central longitudinal axis; and

lost-motion means coupling each locator member with the respective resiliently compressible means such that upon movement of the locator member away from the rest location, toward either one of the first and second locations, the corresponding resiliently compressible means is compressed to establish a resilient restoring force tending to restore the corresponding locator member to the rest location so that upon said loss of motive power, the resiliently compressible means will restore the locator members to the rest location and the actuator member to the rest position, each lost-motion means including longitudinally spaced apart confronting first and second shoulders movable with the corresponding rod, the first coupling member being placed adjacent the first shoulder for engagement and movement therewith when the corresponding locator member is moved in the first direction from the rest location toward one of said first and second locations and the second coupling member being placed adjacent the second shoulder for engagement and movement therewith when the corresponding locator member is moved in the second direction from the rest location toward the other of the first and second locations, and confronting first and second stop means spaced apart longitudinally, each stop means being associated with a corresponding coupling member for precluding movement of the second coupling member in the first direction during movement of the first coupling member in the first direction, and for precluding movement of the first coupling member in the second direction during movement of the second coupling member in the second direction, such that the compression springs of the corresponding pair of compression springs are compressed between the coupling members and bias each coupling member toward a corresponding stop means, the stop means being located relative to the rest location of the shoulders such that each



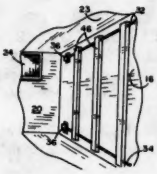
coupling member engages a corresponding shoulder and a corresponding stop means to place the corresponding rod at the rest location in response to the bias of the corresponding compression springs.

4,884,496

SLIDING RIB SIDING FOR REFRIGERATED TRAILERS AND THE LIKE

John X. Donavich, Carterville, Ill., assignor to Transamerica Interway, Inc., Del.

Filed Feb. 1, 1989, Ser. No. 305,460
Int. Cl.[4] B60P 3/20
U.S. Cl. 98—6 19 Claims



1. A device for spacing cargo from the sidewalls of refrigerated units, said device comprising:

an elongated support having ends;

bracket means engaging said support ends for mounting said support to a sidewall of a unit; and

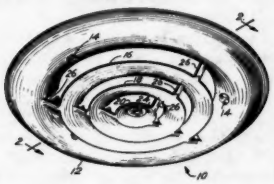
a plurality of elongated ribs, means on said ribs and engaging said support for movably supporting said ribs on said support adjacent the sidewall of the unit, said ribs being selectively movable from a stored position to an operative position spaced along said support, whereby said ribs may be positioned to maintain cargo away from the sidewall of the unit so that air may circulate.

4,884,497

ONE PIECE AIR DIFFUSER

Thomas R. Dosmann, South Bend, Ind., assignor to Continental Industries, Inc., Elkhart, Ind.

Filed Jul. 25, 1988, Ser. No. 223,341
Int. Cl.[4] F24F 13/06
U.S. Cl. 98—40.13 6 Claims



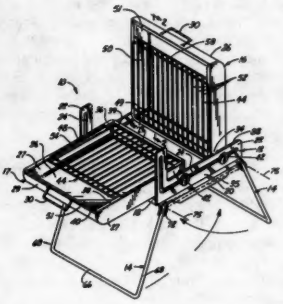
1. An air diffuser comprising a mounting member adapted for securement to a supporting structure and a plurality of concentric air diffuser sections, said diffuser sections displaced in parallel planes laterally outwardly from said mounting member and each other , the improvement wherein said mounting member and said air diffuser sections are formed from a single material sheet with radial inwardly offset integral links extending between the mounting member and the air diffuser sections at an acute angle relative to said planes in the direction of decreasing size of the deflectors, each of said links including an innermost and an outermost end, the outermost end of each link being connected to the next adjacent outer diffuser section, the innermost end being solely connected to a slotted intermediate portion of the next adjacent inner diffuser section or mounting member as the case maybe.

4,884,498

CONTINUOUS DIGESTING APPARATUS

Koji Sengoku, Nara, and Misao Tomita, Ishikawa, both of Japan, assignors to House Food Industrial Company Limited and Takai Tofu & Soymilk Equipment Co., both of, Japan

Filed Sep. 7, 1988, Ser. No. 241,623
Claims priority, application Japan, Sep. 7, 1987, 62-223649; Oct. 1, 1987, 62-248478; Oct. 7, 1987, 62-253315
Int. Cl.[4] A47J 27/00
U.S. Cl. 99—352 4 Claims



1. A continuous digesting apparatus comprising a plurality of material digesting cylinders mutually connected in series, a plurality of steam injecting pipes, each of said steam injecting pipes longitudinally and coaxially extending within one of said raw material digesting cylinders and each of said steam injecting pipes being formed with a plurality of steam injecting apertures, said continuous digesting apparatus further comprising a plurality of partition plates each being formed with a notch and arranged in a space between each of said digesting cylinders and each of said steam injecting pipes to divide said space into a plurality of compartments so that said notches of mutually adjacent partition plates are alternately directed in a diametrically opposite direction to each other, a raw material supplying port formed in the bottom of each of said digesting cylinders, a material discharging port arranged at a position lower than the top of each of said digesting cylinders by a predetermined distance, the distance of said material discharging port from the top of each of said digesting cylinders being larger as the digesting step is later, and a vapor discharging pipe communicated with the top of each of said digesting cylinders for discharging vapor and bubbles therefrom.

4,884,499

PORTABLE GRILL

Eugene F. Rensch, Box 21, Makoti, N. Dak. 58756, and Michael E. Rensch, Box 963, New Town, N. Dak. 58763

Filed Apr. 25, 1988, Ser. No. 185,457
Int. Cl.[4] A47J 37/07
U.S. Cl. 99—449 14 Claims

1. In a portable grill including:

(i) a generally rectangular main frame partially defined by a pair of parallel, spaced apart, elongate frame end members and a pair of parallel, spaced apart, elongate frame side members,

(ii) a pair of generally U-shape frame support means, each open end of each such support means being pivotally mounted with respect to a different one of one of the pairs of mutually parallel frame members, the support means pivot axis at each open end of each support means being coincident to the support means pivot axis of its other open end, and such pivot axis of each support means being parallel to and spaced from the pivot axis of the other support means, each support means being movable be-

tween an operable condition wherein it is in a position to support the rectangular frame and a stowed condition where it lies in generally parallel relation to the frame end members and side members,

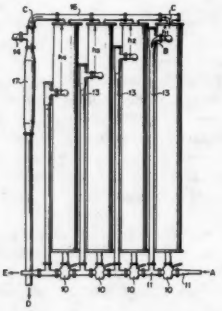
(iii) at least one generally rectangular, open top fuel pan having a bottom wall, a pair of mutually parallel side walls and mutually parallel first and second end walls, the side walls and end walls connecting to each other and extending integrally upwardly from the bottom wall, said pan being adjustably mounted with respect to the main frame to be movable and pivotable about a fuel pan pivot axis adjacent the first pan end wall and parallel to the longitudinal axis of the frame end members between a generally horizontal position and a generally upright position, and

(iv) a grate attachable to the fuel pan to cover a substantial portion of the open top of the fuel pan from the first pan end wall toward but short of the second pan end wall thus to leave a fuel access opening between the grate and the second pan end wall;

the improvement wherein:

(a) the fuel pan also includes a lip extending integrally inwardly from at least the side walls and the first end wall, said lip including at least two side wall portions extending from the two side walls and a first end wall portion extending from the first end wall of the fuel pan, said lip lying in a first fuel pan plane defining the upper edges of the pan side walls and first end wall; and

(b) the grate includes:



(1) a foraminous, generally rectangular framework of relatively closely spaced apart bars lying generally in a single plane and being of configuration and dimension to fit into the fuel pan to lie in closely adjacent relation to but within the inner edges of the fuel pan lip when the grate is attached to the fuel pan, said grate framework being partially defined by two side edge portions and first and second end edge portions,

(2) first and second grate positioning bars extending integrally outwardly from opposed side edge portions of the grate framework and outside the plane of the grate, said positioning bars each being of configuration and dimension to extend over and in contact with both lip side edge wall portions to position the upper surface of the grate framework in said first fuel pan plane when the grate is attached to the pan,

(3) first grate retaining means extending integrally outwardly from said first end portion of the grate framework, said first grate retaining means being of configuration and dimension to extend under and in contact with the lip first end wall portion to tend to retain the grate framework in said first fuel pan plane when the grate is attached to the fuel pan, and

(4) a grate retaining bar integral with a second end portion of the grate framework and of configuration and dimension to extend under and beyond both lip side wall portions to retain the grate framework in the first fuel pan plane when the grate is attached to the pan and the first retaining means is under and in contact with the lip first end wall portion.

4,884,500

APPARATUS FOR MAINTAINING OR RESTORING FRESHNESS OF VEGETABLE BODY

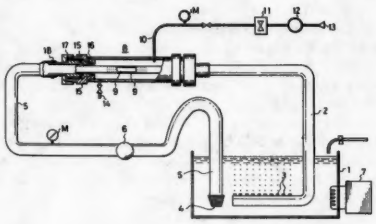
Yoshihiko Iwasaki, 4228, Oazakabayama, Mimata-cho, Kitamorogata-gun, Miyazaki, and Toyosaburo Noguchi, 9, Chuo-machi 1-chome, Saito-shi, Miyazaki, both of Japan

Division of Ser. No. 24,337, Mar. 10, 1987. This application Mar. 13, 1989, Ser. No. 321,997

Claims priority, application Japan, Mar. 15, 1986, 61-57695

Int. Cl.[4] A23B *7/00*

U.S. Cl. 99—517 **6 Claims**



1. An apparatus for restoring or maintaining freshness of a vegetable or vegetable body comprising:

an immersion chamber for said vegetables, said immersion chamber holding a predetermined volume of water at a predetermined temperature;

means provided in the immersion chamber for cooling the water held in the immersion chamber at a temperature from 0° C. to 10° C.;

means for providing an entering flow of water into said immersion chamber, the means having a plurality of jet holes for discharging the entering flow of water into the immersion chamber so as to agitate the water held in the immersion chamber;

means for providing an exit flow of water from said immersion chamber such that the water in the immersion chamber, the entering flow of water into said immersion chamber and the exit flow of from the immersion chamber form a flow system of water for said apparatus;

pump means disposed in the flow system for circulating the water through the flow system; and

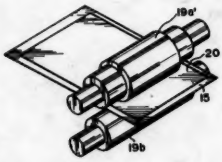
air supply means for supplying air at a predetermined pressure to supersaturate water in said flow system with air at a predetermined location in said flow system such that the supersaturated air-water mixture is provided in said immersion chamber when said vegetables are immersed therein to permit said vegetables to be supplied with predetermined amounts of oxygen from the water in said immersion chamber, the air supply means including a porous wall member composed of porous glass having pores of diameter of 0.1 to 10 microns, and being arranged such that said air passes through said pores and into said water.

4,884,501

PRESSURE DEVELOPING APPARATUS

Takeshi Izaki, Nagoya, and Hiroshi Kawahara, Kiyosucho, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 10, 1987, Ser. No. 131,001
Claims priority, application Japan, Dec. 19, 1986, 61-196642
Int. Cl.[4] B30B *3/04*
U.S. Cl. 100—176 1 Claim



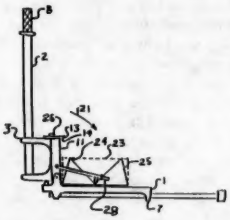
1. A pressure developing system including a first sheet containing thereon photo-sensitive microcapsules and having a latent image formed thereon, a second sheet containing thereon a developer for developing said latent image, and a developing apparatus including a pair of pressure rollers for pressing said first and second sheets together therebetween, at least one of said rollers having a stepped portion having a width narrower than the width of either of said sheets whereby the edges of said sheets are not subjected to any pressing force from said pressure rollers.

4,884,502

METAL CONTAINER CRUSHING DEVICE

William S. Stacey, Jr., 319 Victory Dr., Franklin, N.H. 03235

Filed Jun. 14, 1988, Ser. No. 206,561
Int. Cl.[4] B30B *1/02, 7/04*
U.S. Cl. 100—233 8 Claims



1. A portable, manual metal container crushing device comprising a base member, an arm, compact means and dent means;

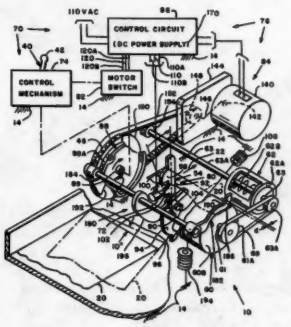
said arm being pivoted to said base member at one end by hinge means, the longitudinal axis of said base member and said arm lying in a plane during pivoting movement of said arm relative to said base member, said arm supporting said compact means and dent means adjacent said hinge means, said dent means being pivotably attached to said compact means and providing a bending surface for crushing the center portion of a container transverse the longitudinal axis of the container, and said compact means supporting lip means on a side furthest away from said hinge means, said compact means and said lip means captively engaging and crushing one end of the container and the lips means projecting from the compact means toward the base member during a crushing movement of said arm.

4,884,503

MAILING MACHINE INCLUDING IMPROVED SHEET FEEDING MEANS

John R. Nobile, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 8, 1989, Ser. No. 307,808
Int. Cl.[4] B41F *13/24*
U.S. Cl. 101—233 10 Claims



1. In a mailing machine including a postage meter and a housing for supporting the postage meter, wherein the mailing machine includes means for individually feeding sheets in a path of travel through the machine, wherein the postage meter includes rotary means for printing indicia on the sheets, and wherein the postage meter includes a roller spaced downstream in the path of travel from the rotary printing means, an improvement in the sheet feeding means, the improvement comprising:

a. an impression roller;

b. an ejection roller and a shaft on which the ejection roller is mounted for rotation therewith;

c. an elongate carriage including a pair of side walls spaced apart from each other, one end of each of the side walls including an arcuately-shaped portion pivotally attaching the carriage to the housing and forming a generally C-shaped bearing bushing;

d. the ejection roller shaft rotatably mounted within the bearing bushings for supporting the ejection roller beneath the postage meter roller;

e. the impression roller rotatably connected to the carriage side walls for supporting the impression roller beneath the rotary printing means;

f. means for rotating the ejection roller shaft and the impression roller; and

g. a spring connecting the other end of the carriage to the housing to permit the carriage to pivot downwardly about the ejection rcller shaft against the force exerted by the spring as the ejection roller shaft rotates within the bearing bushings, thereby permitting mixed thickness sheets to be individually fed between the rotary printing means and impression roller.

4,884,504

METHOD FOR PRINTING OF QUASI RANDOM NUMBER TABLES ON CYLINDRICAL OBJECTS

Ian Sillars, 2704 The Strand, Manhattan Beach, Calif. 90266

Filed Jan. 11, 1988, Ser. No. 142,155
Claims priority, application Australia, Aug. 14, 1987, PI3740
Int. Cl.[4] B41F *17/22*; G07F *7/00*
U.S. Cl. 101—483 6 Claims

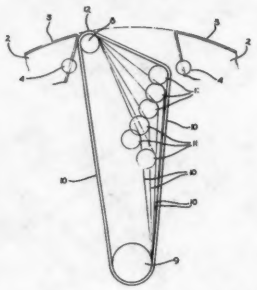
1. A method of printing random numbers on cylindrical objects in a decorating press having a blanket cylinder with a plurality of blanket segments comprising the steps of:

(a) disposing a printing unit comprising at least two unequal

length belts having flexographic printing plates thereon entrained about a printing plate cylinder between two of said blanket segments;

(b) applying ink to said printing plates;

(c) rotating a cylinder against said blanket segments and said



printing plate cylinder such that a pattern of said flexographic plates disposed over said printing plate cylinder is transferred to said cylinder;

(d) advancing said unequal length belts through one increment;

(e) repeating steps (c) and (d).

4,884,505

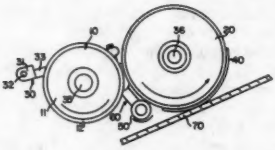
METHOD AND APPARATUS FOR PRINTING A LIGHT SCANNABLE IMAGE

Arthur L. Piepmeier, Jr., Cookeville, and Charles M. Nunally, Baxter, both of Tenn., assignors to Porelon, Inc., Cookeville, Tenn.

Division of Ser. No. 7,160, Jan. 26, 1987, Pat. No. 4,768,437, which is a continuation-in-part of Ser. No. 873,080, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 803,705, Dec. 2, 1985, abandoned. This application Mar. 11, 1988, Ser. No. 166,672

Int. Cl.[4] B41F *1/16*

U.S. Cl. 101—492 **12 Claims**



1. In a method of printing high density, sharp images which includes transferring a high density image-producing ink from an ink roll to a printing surface, and contacting said printing surface to an object to be printed, the improvement which comprises:

said ink roll comprises a microporous structure containing from about 40 to about 90% by weight of ink based on the total weight of said ink roll;

said microporous structure is formed by mixing from about 8 to about 50% by weight of plastic powder with about 10 to about 90% by weight of water-soluble salt, and from about 10 to about 50% by weight of a water-soluble C_2–C_5 alkanediol, in the absence of heating and under vacuum, heating the resulting mixture in a mold to melt said plastic powder to form a cohesive structure conforming to said mold, leaching said salt and said alkanediol from said structure, and drying said structure; and

said method further comprises a step of contacting said printing surface with a smoothing roller after contact with said ink roll and prior to the contact of the printing surface with the object to be printed.

4,884,506

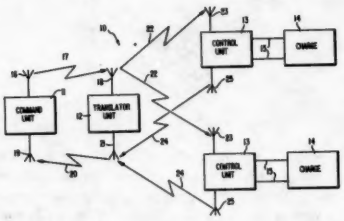
REMOTE DETONATION OF EXPLOSIVE CHARGES

Carl N. Guerreri, Manassas, Va., assignor to Electronic Warfare Associates, Inc., Vienna, Va.

Filed Nov. 6, 1986, Ser. No. 927,362

Int. Cl.[4] F42C *15/40*; F42D *3/00*

U.S. Cl. 102—200 **19 Claims**



1. A device for remotely detonating explosive charges in environments having high levels of extraneous electricity including stray ground currents, electromagnetic fields and radio frequency energy, comprising:

a command unit adapted to repetitively transmit a sequence of coded commands by radio;

a plurality of explosive charges, each of said charges having an electrically activated detonator;

a plurality of control units, one for each of said charges, each of said control units physically connected to one of said charges by signal transmitting means, said transmitting means having length sufficient to allow each said control unit to survive the detonation of its associated explosive charge, each control unit having decoding, logic and transmission means adapted to receive and decode distinctive radio commands from said command unit, to communicate back to said command unit distinctive coded signals confirming receipt of commands from said command unit, and to send a signal through said transmitting means in response to a particular one such command, said signal causing detonation of said charge; and

current flow limiting means adapted to prevent said stray ground currents, electromagnetic fields, radio frequency energy and other extraneous electricity from inducing a current through said electrically activated detonator.

4,884,507

SECURITY CONTAINER

Isy R. Levy, 1015 33rd St., NW., Apt. #406, Washington, D.C. 20007

Filed Nov. 21, 1988, Ser. No. 273,608

Int. Cl.[4] F42C *19/00*; A45C *13/18*

U.S. Cl. 102—293 **16 Claims**

1. A security container for the storage of valuables such as credit cards or the like comprising, in combination:

a body including a lid and a base adapted for interfitting engagement and having walls defining an interior for the storage of valuables;

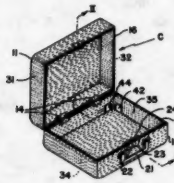
means for hingedly interconnecting said lid and base together for pivotal movement between an open and closed position;

lock means on said body for releasably locking said lid and base together in said closed position;

means within said body interior for ruining said valuables;

a source of electric power on said body; and

normally inoperative circuit means including a continuous conductor on said lid and base walls connected to said source of power and to said ruining means for actuating said ruining means, means associated with said lock means



for interrupting said continuous conductor upon the unauthorized opening of said lock means, said circuit means being responsive to a break in said conductor for operatively conditioning said circuit means to actuate said ruining means thereby ruining said stored valuables.

4,884,508

SPIN STABILIZED CARRIER PROJECTILE EQUIPPED WITH A DRIVING BAND

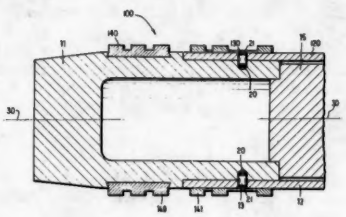
Heinz-Josef Kruse, Ratingen; Klaus D. Karius, Jüchen, and Achim Sippel, Ratingen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 22, 1988, Ser. No. 247,623

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1987, 3734033

Int. Cl.[4] F42B *31/00*

U.S. Cl. 102—524 **16 Claims**



1. A spin stabilized carrier projectile of the type adapted to enclose a plurality of sub-ammunition projectiles which are to be ejected from the carrier projectile over a target area, the carrier projectile comprising:

(a) projectile base;

(b) a thin walled projectile body;

(c) releasable connecting means for fastening said projectile base to said projectile body such that the plurality of sub-ammunition projectiles are enclosed between said projectile base and said projectile body, said connecting means being breakable during flight of the carrier projectile to permit ejection of said plurality of sub-ammunition projectiles;

(d) a first driving band surrounding said projectile base, said first driving band being connected to said projectile base for engaging rifling of a gun barrel for transmitting spin forces to said projectile base during discharge from a gun barrel; and

(e) a second driving band surrounding said projectile body, said second driving band being connected to said projectile body for engaging rifling of a gun barrel for transmitting spin forces to said projectile body during discharge from a gun barrel.

4,884,509

MOBILE TIE GANG APPARATUS

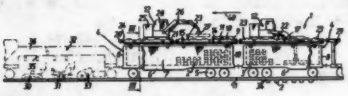
Josef Theurer, Vienna; Johann Hansmann, Klosterneuburg, and Friedrich Oellerer, Linz, all of Austria, assignors to Franz Plasser Bannbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 97,757, Sep. 17, 1987, abandoned. This application Jan. 25, 1989, Ser. No. 302,058

Claims priority, application Austria, Oct. 13, 1986, 2720/86; Feb. 6, 1987, 247/87

Int. Cl.[4] E01B *29/10*

U.S. Cl. 104—9 **28 Claims**



1. A mobile apparatus for sequentially exchanging selected consecutive groups of old ties for groups of new ties in an existing railroad track comprising two rails fastened to consecutively arranged ties while retaining the rails and groups of old ties fastened thereto between the selected groups of new ties for support of the mobile apparatus on the existing railroad track, which comprises

(a) at least one elongated bridge-like work vehicle having two undercarriages supporting respective opposite ends of the work vehicle on the existing railroad track,

(b) a succession of individual devices displaceable in the direction of the railroad track and operative to effectuate different successive operations for exchanging the old ties for the new ties, the devices including

(1) at least two tie pulling and inserting devices for respectively pulling the old ties laterally out of, and inserting the new ties laterally into, the track, and the tie pulling and inserting devices being mounted on a respective work vehicle between the undercarriages,

(c) respective drives for displacing the individual tie pulling and inserting devices with respect to the work vehicle in the direction of the railroad track along a displacement path, and

(d) drive means for continuously advancing the mobile apparatus in said direction,

(1) the displacement path of the individual tie pulling and inserting devices permitting relative movement between the devices and the work vehicle to hold the devices in place while the mobile apparatus continuously advances, in combination with a mobile installation for loading, transporting and unloading the ties on, in and from open top railroad cars, which installation comprises

(e) a train mounted for mobility along the railroad track and including a plurality of said open top railroad cars, adjacent ones of the railroad cars being coupled together and each one of the railroad cars having two parallel side walls with top edges extending in the direction of the railroad track and two end walls, the end walls of the adjacent railroad cars defining respective gaps therebetween,

(f) a power-driven crane for loading and unloading the track parts and having an undercarriage supporting the crane for mobility in the direction of the railroad track, and

(g) a track supporting the undercarriage of the crane for mobility above the top edges of the railroad cars in said direction, the track comprising

(1) two parallel guide rails mounted on the top edges of the railroad cars and being spaced apart a distance corresponding to the gage of the crane undercarriage, the guide rails extending beyond the end walls of the railroad cars into the gaps between the adjacent cars to provide a substantially continuous track for support of

the crane undercarriage along the train of cars, and the mobile tie exchange apparatus further comprising

(h) two parallel guide rails mounted on top of the work vehicle and being spaced apart a distance corresponding to the spacing of the two parallel guide rails mounted on the top edges of the open top railroad cars, the two parallel guide rails on top of the work vehicle continuing the track supporting the undercarriage of the crane.

4,884,510

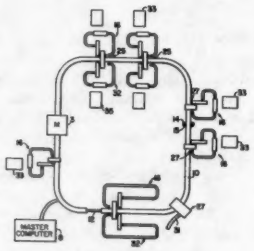
TRANSFER SLIDE ASSEMBLY AND SYSTEM

Robert M. Vaida, Ellington; Harold L. Osthus, West Willington, and Richard Kuchta, Tolland, all of Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Sep. 26, 1988, Ser. No. 249,442

Int. Cl.[4] B61B *3/00*; E01B *25/22*

U.S. Cl. 104—91 **23 Claims**



1. A transfer slide assembly for advancing a trolley from one position to another position comprising:

an elongate body having a longitudinal axis extending along the elongate extent of said body, said body being fixable to a support and having a cavity formed in said body parallel with said longitudinal axis;

said body having longitudinally extending spaced apart surfaces and having an opening extending substantially with said cavity and communicating between said surfaces and said cavity, each of said surfaces being positioned along either side of said cavity opening;

a slide received within said cavity and being moveable longitudinally along said longitudinal axis relative to said body;

means for moving said elongate slide relative to said body; and

pusher means extending from said slide for engaging with a trolley to advance it from said one position to said other position.

4,884,511

ALUMINUM HOPPER CAR WITH CAST COLLARS INTERCONNECTING INTERSECTING CENTER SILL HOOD WITH RIDGE HOOD AND SLOPED END WALLS

Keith J. Hallam, Norcross, and Kenneth H. Smith, Powder Springs, both of Ga., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Jan. 27, 1988, Ser. No. 149,151

Int. Cl.[4] B61D *7/00*; B61F *1/02*

U.S. Cl. 105—247 **10 Claims**

1. An aluminum hopper car for carrying coal and other aggregate materials, comprising:

a car body having a center sill supported by a railway truck at each end;

the center sill having opposing sides and a top;

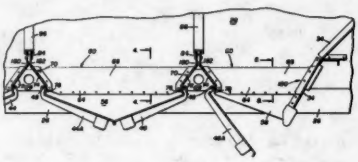
the car body having a pair of spaced apart substantially vertical side walls and a pair of inwardly sloped end walls;

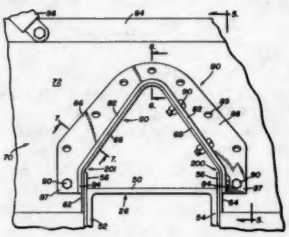
the center sill being covered by a longitudinal center sill hood having spaced apart walls, which abut the center sill sides, and a top which is substantially gable shaped in lateral vertical section;

the center sill hood intersecting each sloped end wall;

a plurality of laterally spaced apart horizontal cross ridge hoods extending between the car side walls and intersecting the center sill hood;

the cross ridge hoods being substantially gable shaped in lateral vertical section;





a cast aluminum cross ridge collar interconnecting the intersection of each cross ridge hood with the center sill hood; and

the cast aluminum cross ridge collar having a first flange with a face in contact with and joined to the center sill hood and a second flange with a face in contact with and joined to the cross ridge hood.

4,884,512

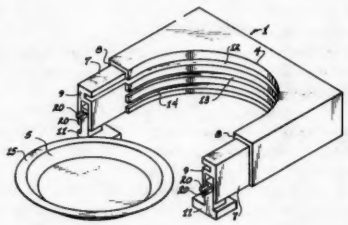
PLATE STABILIZER

Carol Kelly, and Linda Herrington, both of 1963 Parker Rd., Perrysburg, N.Y. 14129

Continuation-in-part of Ser. No. 43,368, Apr. 28, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 276,904

Int. Cl.[4] A47B *85/00*

U.S. Cl. 108—26 **9 Claims**



1. A plate stabilizing means for fitting on a flat surface such as a table or the like, said plate stabilizing means comprising in combination a tray section, tray arms, bracket means, and a food containing means, said tray section having a cut out portion for retaining said food containing means, said food containing means comprising a plate having a rim which fits

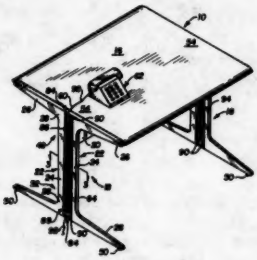
into at least one groove horizontally positioned in a thickness portion of said tray section, said tray section having said tray arms movably extending from its rear portion, said bracket means including means for locking and adjusting the bracket means so as to accommodate various size supporting tables, said bracket means positioned at terminal portions of said arms, said food containing means removably positioned in and from said groove in the thickness portion of said tray section.

4,884,513

WORK ENVIRONMENT SYSTEM

Thomas J. Newhouse, Grand Rapids; Donald D. Goeman, Holland, and Duane G. McClung, Kalamazoo, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Mar. 1, 1988, Ser. No. 162,597
Int. Cl.[4] A47B *35/00*
U.S. Cl. 108—50 **50 Claims**



1. A desk comprising a top and at least one leg supporting said top, said leg comprising:

a first support having a first substantially vertical portion and a first pair of mounting means extending from said first vertical portion;

a second support having a second substantially vertical portion and a second pair of mounting means extending from said second vertical portion, said first pair of mounting means being disposed on said first vertical portion identically as said second pair of mounting means is disposed on said second vertical portion, said first and second supports being mounted together in inverted relationship at said first and second pairs of mounting means, said first and second pairs of mounting means being engaged with and complimentary to one another only when said supports are positioned in inverted relationship; and

securing means cooperating with said first and second pairs of mounting means to securely mount said first and second supports together in inverted relationship.

4,884,514

AUTOMATIC TELLER MACHINE HOUSING

Brent J. Shockey, and Rodney R. Tompkins, both of Wayne, Nebr., assignors to Heritage Industries, Inc., Wayne, Nebr.

Filed Jul. 27, 1988, Ser. No. 224,849
Int. Cl.[4] G07G *5/00*
U.S. Cl. 109—24.1 **4 Claims**

1. In combination:

a housing having a pair of opposite longitudinal sides, opposite ends, top, and bottom, said housing being secured to the ground;

an automatic teller machine (ATM) operably mounted in said housing, comprising:

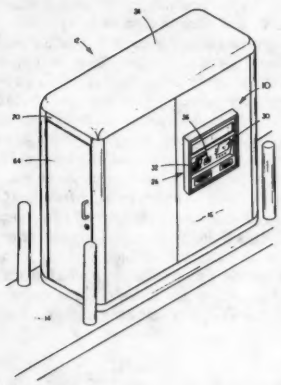
a display panel permanently mounted in a longitudinal side of said housing, and having operable keys thereon;

said display panel further comprising a money-dispensing chute secured therein for dispensing money from the interior of said housing to the exterior of said housing;

internal mechanical and electrical processing components mounted within said housing and electrically connected to said display panel to process transactions entered by said keys; and

a money cassette for dispensing money to said money dispensing chute, operably mounted in said housing for movement independent of said display panel and internal mechanical and electrical processing components;

said housing having a width slightly greater than the depth of the money cassette, but great enough to allow rotational movement of the money cassette;



service entry means for gaining entrance to said housing;

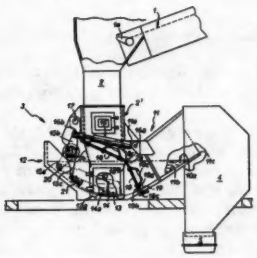
mounting means within said housing for movably mounting said money cassette, said money cassette being movable between an operable position generally perpendicular to the longitudinal sides of said housing and in engagement with said money dispensing chute, and a loading position oriented generally parallel to said housing longitudinal sides and disengaged from said money dispensing chute.

4,884,515

FURNANCE HEARTH ASHBOX WITH EXTRACTOR CHAMBER THAT IS EASY TO UNJAM

Claude Falconnet, Conflans-Saint-Honorine, France, assignor to T.I.R.U. - Traitement Industriel Des Residus Urbains, Paris, France

Filed Jan. 25, 1989, Ser. No. 301,356
Claims priority, application France, Jan. 29, 1988, 88 01054
Int. Cl.[4] F23D *1/02*
U.S. Cl. 110—171 **12 Claims**



1. Ashbox for the hearth of a furnace adapted to burn solid fuel, especially urban waste, discharged onto an upper end of

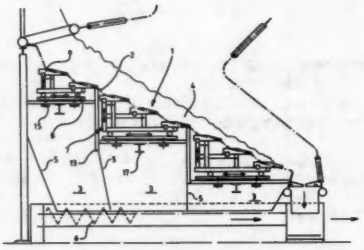
an inclined grate and descending along said grate as it burns to a lower end of said grate, the ashbox comprising an extractor chamber having an upper edge and a concave bottom which is part-cylindrical with horizontal generatrices, said chamber being adapted to be filled with water to a normal level below that of said upper edg, a vertical clinker well under the lower end of said grate, terminating at a lower lip below said upper edge of said chamber and adapted to be immersed in the water in said chamber when filled to said normal level, a scraper blade adapted to bear on said concave bottom of said chamber along a generatrix thereof, means for reciprocating said scraper blade perpendicularly to the generatrices of said concave bottom of said chamber, an inclined wall merging at its lower end with said concave bottom of said chamber along a generatrix thereof, and an overflow lip at the upper end of said inclined wall above the normal level of the water in said chamber, the arrangement being such that reciprocation of said scraper blade pushes ash up said inclined wall and over the overflow lip, into recovery means, in which ashbox said extractor chamber is in two parts and can be opened by relative displacement thereof to provide vertical access to said ash well, one part of said chamber being a fixed part comprising said inclined wall and said upper edge of said chamber and the other part being a tilting part comprising said concave bottom and said scraper blade and adapted to pivot relative to said fixed part about an axis parallel to said generatrices of said concave bottom between an open position and a closed position in which it is sealed to said fixed part on a sealing surface.

4,884,516

INCLINED GRATE APPARATUS FOR USE IN THE COMBUSTION CHAMBER OF A COMBUSTION FURNACE

Lauri G. Linsén, Rantasalmi, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Nov. 30, 1988, Ser. No. 277,822
Claims priority, application Finland, Dec. 22, 1987, 875648
Int. Cl.[4] F23H *7/08, 7/14*
U.S. Cl. 110—281 **13 Claims**



1. An inclined grate apparatus for use in the combustion chamber of a combustion furnace, comprising:

a grate comprising a plurality of adjacent grate tubes extending longitudinally, and connected together by flat bar means;

a grate bar carriage disposed below said grate, said carriage mounted for horizontal reciprocation relative to the grate, said carriage supporting at least one grate bar, and being mounted so that during use said grate bar is pushed through said grate via an opening in said flat bar means between two adjacent grate tubes when the grate bar carriage moves toward the grate;

means for reciprocating said carriage to effect pushing of said grate bar through said grate; and

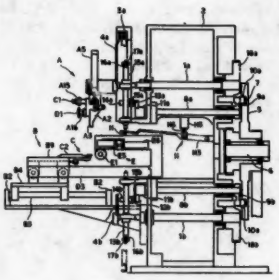
adjustment means for providing for vertical displacement of said grate bar carriage.

4,884,517

METHOD AND APPARATUS FOR BUTTON SEWING

Hideo Asao, Mitaka; Satoru Yamazi, and Seiichi Saibe, both of Kashihara, all of Japan, assignors to Juki Corporation, Tokyo, Japan

Division of Ser. No. 193,333, May 12, 1988. This application Apr. 7, 1989, Ser. No. 335,100
Claims priority, application Japan, May 11, 1987, 62-115492
Int. Cl.[4] D05B *3/14*
U.S. Cl. 112—112 **1 Claim**



1. In a button sewing machine having a driving device to traverse a needle with the predetermined length of thread for sewing attached thereto comprising an upper-needle-bar and a lower-needle-bar which are arranged to conduct relative up-down motion, and a moving device which moves a workpiece with a button attached thereto in direction of X-Y, a button sewing aparatus comprising:

(a) a surface button chucking device which clamps and releases the periphery of a surface button,

(b) a surface button turning device which turns said surface button holding device to be positioned aside from the needle's passage-way,

(c) a bifurcated surface button holder which is retractable to the underside of a surface button for positioning outside of the sewed thread,

(d) a thread holding device which slidably clamps and releases the thread,

(e) a thread guide which guides a thread to a position underneath a needle.

4,884,518

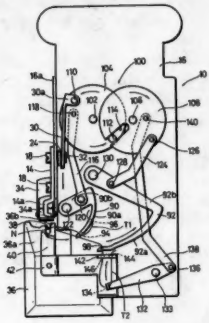
OVERCASTING ATTACHMENT FOR USE WITH A SEWING MACHINE

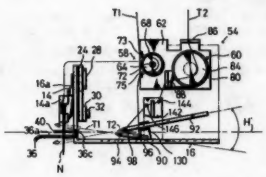
Mikio Mori, 12-2, Chidori-Cho 3-Chome, Ogaki-shi, Gifu-ken 503, Japan

PCT No. PCT/JP87/00823, § 371 Date Jun. 15, 1988, § 102(e) Date Jun. 15, 1988, PCT Pub. No. WO88/03187, PCT Pub. Date May 5, 1988
PCT Filed Oct. 27, 1987, Ser. No. 210,512
Claims priority, application Japan, Oct. 31, 1986, 61-260890
Int. Cl.[4] D05B *1/20, 57/06*
U.S. Cl. 112—162 **2 Claims**

1. An overcasting attachment for use with a sewing machine having a presser bar, a needle bar provided with a needle, and a feed dog, comprising a base plate; a mounting fixture for removably securing said base plate to said presser bar of said sewing machine; a needle bar interlocking mechanism mounted on a portion of said base plate and movable in operative association with said needle bar; an upper cross thread guide lever and a lower cross thread guide lever both supported on said base plate and carrying an upper cross thread and a lower cross thread, respectively, at the respective distal ends thereof; a cross thread guide lever driving mechanism operatively connected to said needle bar interlocking mecha-

nism for transmitting the movement of said needle bar interlocking mechanism to said upper and lower thread guide levers in a manner such that said upper and lower thread guide levers may engage said upper and lower cross threads with a needle thread and a bobbin thread for straight stitching, respectively, in timed relation to the time when said needle passes through a cloth to be sewn and may engage said upper and lower cross threads with each other at a suitable time before said needle passes through the cloth to be sewn; a cloth-pressing member secured to said base plate for pressing the edge of the cloth to be sewn against said feed dog of said sewing machine; and a cloth guide member including a cloth guide portion disposed in front of said cloth-pressing member for slightly raising the edge of the cloth at the needle location, so that said lower cross thread guide lever passes below the cloth, and a stitch width restricting portion disposed laterally of said needle for restricting the width of overcasting stitches; wherein said cross thread guide lever driving mechanism moves said lower cross thread guide lever from above said upper cross thread guide lever to below the same in a substantially straight and relatively inclined manner, as said lower cross thread guide lever moves





toward a position of engagement with said bobbin thread for straight stitching; wherein said cross thread guide lever driving mechanism moves said upper cross thread guide lever in a manner such that as said upper cross thread guide lever moves toward a position of engagement with said needle thread for straight stitching, said upper cross thread guide lever moves ahead of said lower cross thread guide lever and passes below and engages a portion of said lower cross thread extending between the distal end of said lower cross thread guide lever and the stitch already formed with said bobbin thread; wherein the movement of said lower cross thread guide lever toward the position of engagement with said bobbin thread for straight stitching is started in substantially synchronized relation to the engagement of said upper cross thread guide lever with said lower cross thread; wherein during the movement of said upper and lower cross thread guide levers toward the respective positions of engagement with the associated threads for straight stitching, said cross thread guide lever driving mechanism moves said lower cross thread guide lever in a downwardly inclined manner relative to a horizontal plane and moves said upper cross thread guide lever substantially straight in an upwardly inclined manner relative to a horizontal plane; and wherein said cross thread guide lever driving mechanism comprises a first rotary member supported by said base plate for rotation in a substantially horizontal plane and adapted to be driven for reciprocating rotation through a predetermined angle, said first rotary member having a pin adjacent a peripheral portion thereof; a second rotary member supported by said base plate for rotation in a plane substantially parallel to the plane of said first rotary member and partly overlapping said first rotary member, said second rotary member having a guide groove substantially radially extending for engagement with said pin of said first rotary member; a first rotation interlocking lever pivotally connected at respective ends thereof to said first rotary member and said upper cross thread guide lever and adapted to convert the reciprocating rotational movement of said first rotary member into a swinging movement of said upper cross thread guide lever; and a second rotation interlocking lever pivotally connected at respective ends thereof to said second rotary member and said lower cross thread guide lever and adapted to convert the reciprocating rotational movement of said second rotary member into a swinging movement of said lower cross thread guide lever.

4,884,519

BOBBIN CASE HOLDER WITH ADJUSTABLE THREAD TENSIONING DEVICE

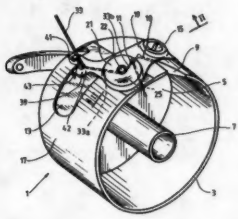
Ernst Dreier, Steckborn, Switzerland, assignor to F. Gegauf AG Bernina-Nähmaschinenfabrik, Steckborn, Switzerland

Filed Nov. 7, 1988, Ser. No. 268,164

Claims priority, application Switzerland, Nov. 11, 1987, 4404/87

Int. Cl.[4] D05B *63/00*

U.S. Cl. 112—229 **19 Claims**



1. A case for a bobbin which carries thread for a sewing machine, comprising a tubular wall having an external first surface; a spring adjacent said first surface; and a thread tensioning member interposed between said first surface and said spring to bias the thread which extends from the case against said first surface, said tensioning member having a second surface which is adjacent and complementary to said first surface, and said surfaces being substantially flat.

4,884,520

LOOP TAKER AND SEWING MACHINE

Hiromitsu Shimizu, Osaka, Japan, assignor to Hirose Manufacturing Company, Limited, Osaka, Japan

Filed Jul. 20, 1987, Ser. No. 76,717

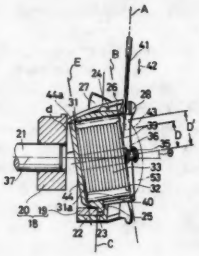
Claims priority, application Japan, Apr. 28, 1987, 62-105535

Int. Cl.[4] D05B *57/26*

U.S. Cl. 112—231 **17 Claims**

1. A loop taker comprising a bobbin case holder in which is housed a bobbin whose axis is inclined relative to the rotational axis of a cup-shaped hook body in such a way that the bobbin is kept away from a path of needle movement, the path of needle movement being along a needle axis which intersects a plane containing one axial end of the bobbin, the plane being

perpendicular to the axis of the bobbin and the path of needle movement terminating at a point spaced from the axis of the



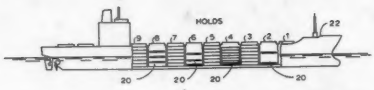
bobbin by a distance less than a distance between the axis of the bobbin and a radially outermost point of the bobbin.

4,884,521

FAST LOADING ARTICULATED PLATFORMS SYSTEM—FLAPS

Sidney I. Belinsky, 40 Waterside Plz. Apt. 14-A, New York, N.Y. 10010

Filed Apr. 22, 1987, Ser. No. 41,195
Int. Cl.[4] B63B *3/48*
U.S. Cl. 114—72 **9 Claims**



1. A fast loading articulated platform system for rapid conversion of a containership's cellular hold into a multi-deck arrangement for handling general cargo, comprising:

a section of the containership's cellular hold containing a set of moveable deck sections, oriented vertically one above the other, and a set of bearers, to fix the vertical position of said moveable deck sections on different levels and to transfer forces from said moveable deck sections to the containership's main structural elements;

means for rapid connection between said moveable deck sections and said bearers:

means for guiding vertical movement of said moveable deck sections along the entire height of said cellular hold;

means for providing vertical access to the movable deck section located below other said moveable deck sections by pivoting each said other moveable deck section about one of its edges to a vertical position and storing each said other movable deck section in said vertical position, said moveable deck sections having a width larger than the height between adjacent movable deck sections, and means for securing said pivoted moveable deck sections in said vertical position;

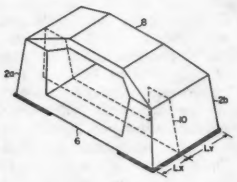
means for accommodating containers above said moveable deck sections, when they are stored one on top of each other on the containership's hold bottom.

4,884,522

TANK STABILIZER

Kiyomi Minohara; Satoshi Sogabe, both of Takarazuka, and Shinichiro Suzuki, Takatsuki, all of Japan, assignors to Furuno Electric Company Limited, Hyogo, Japan

Filed May 20, 1988, Ser. No. 197,022
Claims priority, application Japan, May 20, 1987, 62-75390
Int. Cl.[4] B63B *39/03*
U.S. Cl. 114—125 **8 Claims**



1. A tank stabilizer mounted on a vessel comprising:

(i) a pair of end chambers which are capable of holding stabilizing liquid,

(ii) crossover duct interconnecting said end chambers near the lower portion thereof for transferring the stabilizing liquid between said end chambers, and

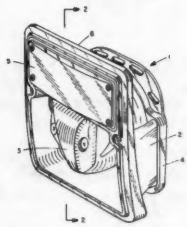
(iii) means for separating said end chambers and said crossover duct so that there are obtained two receptacles for holding the stabilizing liquid which are different in space volume from each other, with one receptacle having a higher natural frequency of stabilizing liquid movement with respect to the inherent roll frequency of the vessel and the other receptacle having a lower natural frequency of stabilizing liquid movement with respect to the inherent roll frequency of the vessel.

4,884,523

VEHICLE WARNING SYSTEM

Basil W. Wheeler, 1207 N. Hine St., Athens, Ala. 35611

Continuation-in-part of Ser. No. 837,011, Mar. 6, 1986, Pat. No. 4,718,372. This application Jan. 12, 1988, Ser. No. 142,915
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] G08B *7/06*; G10K *11/00*
U.S. Cl. 116—3 **21 Claims**



1. A vehicular warning system comprising:

a main housing arranged for attachment to said vehicle, said main housing comprising an expander horn having a closed end and a generally rectangular shaped open end;

a deflector attached to said main housing, said deflector arranged to deflect sound waves through two 90° changes of direction;

a sound generator attached to said deflector and to said main housing;

a mounting base for mounting said warning system on a

vehicle, said mounting base being attached to said main housing; and

a trim means for covering and concealing said mounting base and portions of said housing, said trim means being attached to said housing.

4,884,524

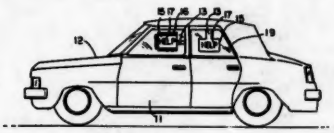
VEHICLE DISTRESS SIGNAL

Peter L. Minotti, R.D. #1, Easton, Pa. 18042

Filed Oct. 20, 1988, Ser. No. 260,460

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 116—28 R **10 Claims**



9. A vehicle distress signal comprising:

a flexible banner having two surfaces;

attention attraction means being provided on at least one of said surfaces, said attention attraction means comprising a plurality of light means on at least one of said surfaces means for connecting said plurality of right means to an electrical energy source, light reflective means distributed about said surface, and message means;

clamp means at one end of said banner for attaching said banner to a vehicle at the vehicle door; and

means for supplying electrical energy for activating said light means.

4,884,525

SINGLE OR TWO-SIDED GALVANIZING PLANT

Paul Fontaine, Ermlandstr. 45, D-4018 Langenfeld; Klaus Frommann, Meerbusch, and Rolf Michel, Drensteinfurt, all of Fed. Rep. of Germany, assignors to Paul Fontaine, Langenfeld, Fed. Rep. of Germany

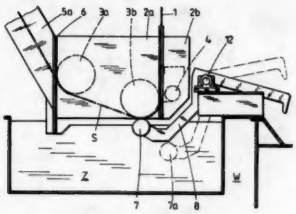
PCT No. PCT/EP87/00410, § 371 Date Mar. 14, 1988, § 102(e) Date Mar. 14, 1988, PCT Pub. No. WO88/00983, PCT Pub. Date Feb. 11, 1988

PCT Filed Jul. 29, 1987, Ser. No. 177,545

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625680

Int. Cl.[4] B05C *11/00*

U.S. Cl. 118—65 **14 Claims**



1. An installation for zinc coating a continuous supply of steel strip which installation is operable in a first mode for coating one side of said steel strip and is operable in a second mode for coating both sides of said steel strip, said installation comprising a vessel to contain liquid zinc above a predetermined level; and interchangeable first and second coating units for use in respective said first and second modes of operation, said first coating unit comprising means for use in coating one side only of a continuous steel strip with said liquid zinc, said second coating unit comprising means for use in coating both sides of a continuous steel strip with said liquid zinc, each said coating unit including a mounting flange whereby the units are adapted to be interchangeably readily connected in a gas tight manner to and disconnected from a corresponding flange to be provided on a duct for the supply of steel strip in an inert gas atmosphere from a furnace in use, each said coating unit being removable without cutting said continuous steel strip, and said mounting flange of each unit when connected to the flange of the duct projecting downwardly below said predetermined level in said vessel whereby the connection between said mounting flange and the duct flange will be closed at its lower end by said liquid zinc.

4,884,526

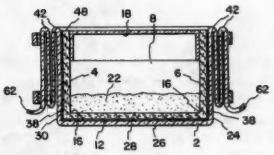
DISPOSABLE KITTY LITTER BOX AND BAG COMBINATION

Cidell M. Giannakopoulos, 19 Abbeywood, Romeoville, Ill. 60441

Filed Nov. 5, 1987, Ser. No. 116,829

Int. Cl.[4] A01K *29/00*

U.S. Cl. 119—1 **20 Claims**



1. A disposable litter assembly comprising a first receptacle having a substantially leak proof peripheral wall, including a bottom peripheral wall portion and an upwardly extending peripheral wall portion extending upwardly from said bottom peripheral wall portion a first dimension, a second receptacle having a substantially leak proof peripheral wall, said first receptacle being within said second receptacle, said first receptacle having a cavity therein to receive a quantity of litter, said peripheral wall of said second receptacle having a lower peripheral portion thereof adjacent, co-extensive with and facing said upwardly extending peripheral wall portion and said bottom peripheral wall portion of said first receptacle to provide two substantially leak proof walls surrounding said cavity of said first receptacle for double protection against leaks from said cavity, said lower peripheral portion of said peripheral wall of said second receptacle extending across and outwardly of said bottom peripheral wall portion of said first receptacle and upwardly alongside said upwardly extending peripheral wall portion of said peripheral wall of said first receptacle a distance equal to said first dimension and supported thereagainst to provide the second one of said two substantially leak proof walls surrounding said cavity of said first receptacle, said peripheral wall of said second receptacle having an upper peripheral portion thereof extending upwardly from said lower peripheral portion thereof a distance at least as great as said first dimension, said upper peripheral portion doubled back against and facing said lower peripheral portion, and releasable retaining means positioned entirely outwardly of said cavity and of said first receptacle to releasably retain said doubled back upper peripheral portion in facing relationship against said lower peripheral portion of said peripheral wall of said second receptacle until the useful life of said litter assembly has been completed and both of said first and second receptacles are to be disposed of, said upper peripheral portion of said peripheral wall of said second receptacle when released after said useful life of said litter assembly has been completed being extendable upwardly from said peripheral wall of said first receptacle a sufficient distance to close said second receptacle

with said first receptacle and said cavity closed therein, including hold together means to hold at least a portion of said first receptacle and said second receptacle together for disposal of both together and to deter disposal of one without the other.

4,884,527

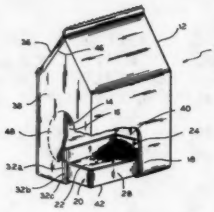
SELF-CONTAINED DISPOSABLE ANIMAL COMMODE

Marc A. Skirvin, 1430 W. Lunt, #305, Chicago, Ill. 60626

Filed Sep. 18, 1987, Ser. No. 98,237

Int. Cl.[4] A01K *1/00*

U.S. Cl. 119—1 **17 Claims**



1. A self-contained disposable animal commode, comprising:

container means having an access opening formed therein, said container means defining a substantially entirely enclosed space, said container means being collapsible for shipping and expansible for use;

said container means including a base portion defining a box-like receptacle having an open top and a cover portion cooperating with said base portion to define said substantially entirely enclosed space; and

a loose material disposed in said base portion of said container means;

said base portion of said container means being adapted to support an animal for defecation and urination into said loose material;

said cover portion of said container means being movable from a collapsed position substantially conforming to said base portion to an expanded portion;

said expanded position causing said cover portion to be positioned to comfortably receive said animal in said substantially entirely enclosed space, said expanded position also causing said access opening to be positioned for ingress and egress of said animal therethrough;

said box-like receptacle defining said base portion comprising a pan and said cover portion comprising a bag formed of flexible material, said bag being formed of a material having a flexible plastic inner surface, said bag having a pair of side walls, a front wall, a back wall, and a bottom wall, said front wall of said bag being integrally joined at corresponding edges of said side walls and to said bottom wall along one side of said pan;

said access opening including a perforated panel in one of said walls of said bag so as to be entirely concealed when said cover portion is in said collapsed position.

4,884,528

WATER PIPE BRACKET AND CLIP FOR POULTRY, SMALL ANIMALS AND THE LIKE WATERING SYSTEM

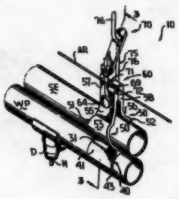
Frederick W. Steudler, Jr., New Providence, Pa., assignor to Val Products, Inc., Bird-in-Hand, Pa.

Continuation-in-part of Ser. No. 908,162, Sep. 17, 1986, Pat. No. 4,724,797, which is a continuation of Ser. No. 773,128, Sep. 6, 1985, Pat. No. 4,669,422. This application Feb. 12, 1988, Ser. No. 155,408

Int. Cl.[4] A01K *39/02*

U.S. Cl. 119—72.5 **21 Claims**

1. A hanger bracket particularly adapted for a floor watering system for poultry, small animals and the like comprising a body, said body having first means for securing thereto a length of pipe having an axis and through which water is adapted to flow for watering poultry, small animals or the like, said body having second means for securing thereto an elongated stabilizing element whose added weight is adapted for stabilization purposes, a suspension element connected to said bracket for suspendingly supporting the same at a predetermined height above a supporting surface, said first and second securing means each being defined by a pair of spaced flexible clamping arms adapted to flexibly embrace and secure therebe-



tween an associated water pipe and stabilizing element, respectively; the clamping arms of the pair of clamping arms project in opposite directions away from each other, a first of said pair of clamping arms opening downwardly and being adapted to receive therein a waterpipe, clip means for preventing the inadvertent removal of said pipe from within said first pair of clamping arms, and said clip means and first pair of clamping arms including cooperative fastening means for securely but removably securing said clip means to said first pair of clamping arms.

4,884,529

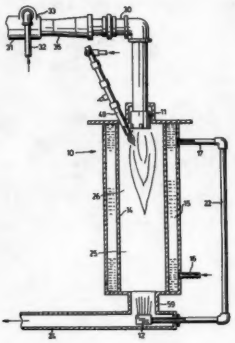
STEAM GENERATOR

Thomas S. Byrnes, Ontario, Canada, assignor to Blower Engineering, Inc., Concord, Canada

Continuation-in-part of Ser. No. 120,011, Nov. 12, 1987, abandoned. This application Feb. 28, 1989, Ser. No. 318,446

Int. Cl.[4] F22B *9/02*

U.S. Cl. 122—115 **8 Claims**



1. A steam generator, comprising:

a combustion chamber having a water jacketed sidewall defining first and second ends of the chamber, an inlet and an outlet means for the circulation of water through the jacket;

a burner positioned at the first end of the combustion chamber;

means for delivering pressurized air and fuel to the burner,

so that the burner may produce a flame extending toward the second end of the combustion chamber;

a water spray nozzle positioned at the second end of the combustion chamber remote from the burner flame, said nozzle being connected to the outlet means of the jacket and being adapted to spray water countercurrently into a stream of hot gases from the burner flame thereby creating steam without quenching the flame; and

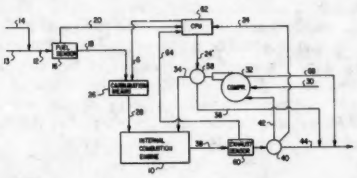
an outlet means at the second end of the combustion chamber being connected to a conduit for conveying the steam so generated.

4,884,530

METHOD FOR ADAPTING AN INTERNAL COMBUSTION PISTON ENGINE TO RUN AT OPTIMUM COMPRESSION RATIOS ON A VARIETY OF FUELS REQUIRING DIFFERENT COMPRESSION RATIOS

Kenneth L. Boekhaus, Yorba Linda, Calif., and Fred L. Voelz, Munster, Ind., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 27, 1987, Ser. No. 125,953
Int. Cl.[4] F02B *75/12*
U.S. Cl. 123—1 A **6 Claims**



1. A method for combusting a fuel selected from a group of fuels requiring different maximum compression pressures, said group of fuels consisting of hydrocarbons, alcohols, hydrogen, disassociated methanol and mixtures thereof in a combustion chamber enclosed by a piston in a cylinder at optimum combustion conditions, said method consisting essentially of:

(a) selecting a fuel;

(b) inducting said selected fuel into said cylinder;

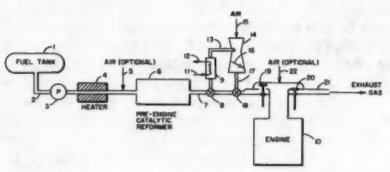
(c) injecting a quantity of an oxygen-containing gas into said cylinder to produce a combustion mixture of said selected fuel and said oxygen-containing gas, said gas being injected at a pressure and volume sufficient to produce the optimum maximum compression pressure desired for combustion of said selected fuel upon compression in said cylinder.

4,884,531

OPERATION OF AN INTERNAL COMBUSTION ENGINE WITH A PRE-ENGINE REFORMER

Thomas F. Degnan, Jr., Yardley, Pa., and Ralph M. Dessau, Edison, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 30, 1988, Ser. No. 213,855
Int. Cl.[4] F02B *43/08*
U.S. Cl. 123—3 **20 Claims**



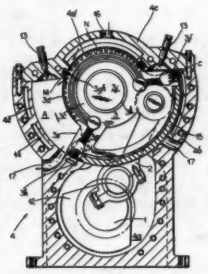
1. A method of operating an internal combustion engine comprising subjecting a hydrocarbon fuel of relatively low octane number to in situ reforming at elevated temperatures by passing it through a reaction zone containing a substantially non-acid catalyst comprising a Group VIII hydrogenation/-dehydrogenation metallic element and a substantially non-acid intermediate pore zeolite, such that the fuel leaving said reaction zone has an increased octane number, and passing the fuel to the combustion chamber of said engine.

4,884,532

SWINGING-PISTON INTERNAL-COMBUSTION ENGINE

Cheng Tan, and Lihua Jiang, both of No. 6 Nong 128, Xizhijie, Changzhou City, China

Continuation of Ser. No. 847,151, Apr. 1, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 180,611
Claims priority, application China, Apr. 1, 1985, 85100486
Int. Cl.[4] F02B *53/00*
U.S. Cl. 123—18 R **1 Claim**



1. A swinging-piston internal-combustion engine, comprising a crankshaft (1) supported in a cylinder body (4) formed by two planar end walls (4*a*), a middle part (4*b*) and a the latter two defining bid and little coaxial cylindrical inner surfaces (4*e*, 4*d*), respectively, a cylindrical shaft (3*j*) supported between the end walls, a swinging piston (3) pivotably mounted on the cylindrical shaft, a connecting rod (2) connecting the piston with the crankshaft, an intake port (16) in the head (4*c*), oil nozzles (13) mounted on the cylinder body for combustion chambers (A, C) on opposite sides of the intake port, exhaust ports (17) in the cylinder body (4) for the combustion chambers, end surfaces (3*c*) on the swinging piston at the end walls, a cylindrical surface (3*d*) between the end surfaces of the swinging piston, two radially-extending portions (3*e*, 3*f*) sealingly projecting from the cylindrical surface of the swinging piston to the big cylindrical inner surface for defining a variable, working volume of the combustion chambers, two regions (M) of the head for sealing to the cylindrical surface of the swinging piston at the combustion chambers (A, C), transfer ports (N) on one side of the cylindrical surface of the swinging piston at the head for providing air from the intake port to each combustion chamber, and a slide shoe (15) on the opposite side of the swinging piston from the transfer ports and between the radially extending portions of the swinging piston for blocking the exhaust ports, whereby to complete uniflow scavenging of the combustion cylinders.

4,884,533

METHOD OF AND AN ARRANGEMENT FOR BURNING A LIQUID OR GASEOUS FUEL IN A COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

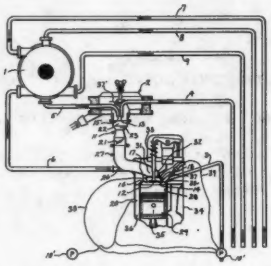
Antonio Risitano, V. le Andrea Doria 6, Catania, Italy I-95125; Lanzafame Rosario, Via Vaccarini 11, S. Agata Li Battiati, Italy I-95030, and Eugen Popp, Wildenwarterstr. 20, Bundesrepublik Deutschland Munchen 82, Fed. Rep. of Germany D-8000

Filed Feb. 3, 1988, Ser. No. 166,382

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1986, 3618700

Int. Cl.[4] F02M *25/04*

U.S. Cl. 123—25 C 28 Claims



1. A method of burning a fuel in the presence of an oxidant such as air and water in a combustion chamber of an internal combustion engine, comprising supplying fuel to the combustion chamber, sensing the temperature of the fuel within the combustion chamber during at least one of a series of selected phases of engine operation, introducing water into the combustion chamber at a sensed temperature just below the critical "knock" temperature (T_c) and creating a progressive primary combustion of fuel and air which initiates a corresponding progressive secondary combustion of the mixed fuel and water.

4,884,534

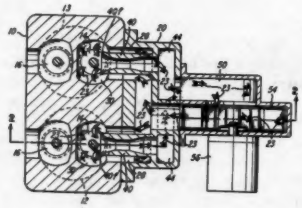
FUEL AND AIR INDUCTION STRUCTURE AND MECHANISM FOR INTERNAL COMBUSTION ENGINES

Jesse C. Moore, Celina, Ohio, assignor to J. C. Moore Research, Inc., Celina, Ohio

Filed Nov. 25, 1988, Ser. No. 275,936

Int. Cl.[4] F02B *75/18*

U.S. Cl. 123—52 MV 10 Claims



1. Fluid induction structure for an internal combustion engine which has a plurality of combustion chambers, there being an inlet port region adjacent each combustion chamber, each inlet port region being formed by walls which are heated by operation of the internal combustion engine, there being a plurality of valves in which there is a valve which is operable to open and to close each combustion chamber, each valve in the open position thereof permitting fluid communication between the respective combustion chamber and the respective inlet port region, the induction structure comprising means forming an inlet passage for flow of fuel and air as a mixture into the structure, means forming a first fluid manifold, means forming a connection passage for fluid communication between the inlet passage and the first fluid manifold, means forming a plurality of intermediate passages for fluid communication between each inlet port region and the first fluid manifold, whereby the first fluid manifold is in fluid communication with the inlet port regions of all of the combustion chambers, means forming a second fluid manifold, means forming a plurality of fluid conduit members, there being a fluid conduit member adjacent the inlet port region of each of the combustion chambers and in fluid communication with the second fluid manifold, a continuously operating fluid pump, means forming a first transfer passage, the first transfer passage providing fluid communication between the second fluid manifold and the fluid pump, means forming a second transfer passage, the second transfer passage providing fluid communication between the first fluid manifold and the fluid pump, whereby fuel and air as a mixture flows into the first fluid manifold and from the first fluid manifold to all of the inlet port regions of the combustion chambers, the fuel and air as a mixture then flowing from each of the inlet port regions and into each respective fluid conduit member, the fuel and air as a mixture then flowing in each of the fluid conduit members to the second fluid manifold and from the second fluid manifold to the fluid pump and from the fluid pump to the first fluid manifold, whereby there is continuous circulation of fuel and air as a mixture within the fluid manifolds, and whereby a portion of the fuel and air as a mixture flows from each inlet port region and into its respective combustion chamber when the valve of the combustion chamber is in an open position.

4,884,535

STARTING SYSTEM FOR INTERNAL COMBUSTION ENGINE

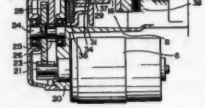
Giichi Iida, and Taketomo Kodama, both of Tokyo, Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Nov. 9, 1988, Ser. No. 268,961

Claims priority, application Japan, Nov. 11, 1987, 62-172207[U]

Int. Cl.[4] F02N *3/02, 5/02, 11/00*

U.S. Cl. 123—179 P 2 Claims



1. A starting system for an internal combustion engine, wherein one of connecting members of a clutch device is fixedly mounted on a crankshaft of said internal combustion engine, a ratchet pawl member which engages with an engagement member attached to a recoil drum of a recoil-type manual starter being mounted on said one connecting member, an axial bore being formed in a boss portion supporting said recoil drum of said recoil-type manual starter, an output shaft of a reduction device of an automatic starter being arranged into said axial bore to pass through said axial bore, an other connecting member of said clutch device being arranged on said output shaft in such a manner that said other connecting member can be shifted axially to engage or disengage with respect to said one connecting member.

4,884,536
INTERCONNECTING ROTARY AND RECIPROCATORY MOTION

Neale, Michael J., Hampshire, and Polak, Thomas A., Farnham, both of United Kingdom, assignors to Collins Motor Corporation Limited, West Perth, Australia

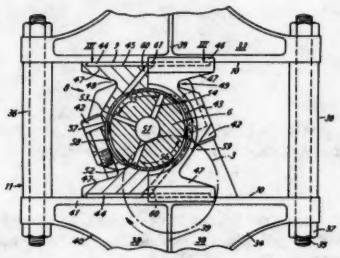
PCT No. PCT/GB88/00419, § 371 Date Jan. 26, 1989, § 102(e) Date Jan. 26, 1989, PCT Pub. No. WO88/09427, PCT Pub. Date Dec. 1, 1988

PCT Filed May 27, 1988, Ser. No. 305,731

Claims priority, application United Kingdom, May 29, 1987, 8712645

Int. Cl.[4] F02B *75/32*

U.S. Cl. 123—197 AC **8 Claims**



1. Apparatus for converting rotary motion to reciprocatory linear motion and vice versa, comprising:

a rotary member mounted for rotation about a first axis,

a reciprocatory member guided for reciprocatory motion in a reciprocation direction transverse to the first axis,

a drive block rotatably mounted on an eccentric portion of the rotary member, the drive block having a slide surface slidably engaged with a guide surface carried by the reciprocatory member extending transversely to the reciprocation direction, and means for supplying liquid lubricant to the slide surface, wherein portions of the drive block supporting the portions of the slide surface are sufficiently elastically flexible in bending to follow deflections of the guide surface so as to maintain a load-bearing film of lubricant between the slide surface and the guide surface along substantially the whole length of the slide surface when under load.

4,884,537
ROTARY INTERNAL COMBUSTION ENGINE

Jan Witkowski, New Britain, Conn., assignor to Raul Castells, Miami, Fla., a part interest

Filed Feb. 19, 1988, Ser. No. 157,587

Int. Cl.[4] F02B *53/00*

U.S. Cl. 123—248 **7 Claims**

1. An internal combustion engine assembly comprising:

a central rotor means formed with at least one peripheral fuel cavity,

said cavity having a first surface defining a thrust surface and a second surface defining a contoured surface,

a housing means enclosing said rotor and having an internal wall encircling said rotor,

said internal wall being intercepted by at least two recesses defining cylinder means,

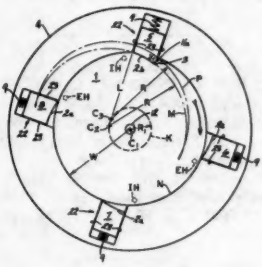
said housing means and said rotor means being relatively rotatable,

piston means individual to each said cylinder means and reciprocable therein,

each piston means having a working face complementary to said contoured surface,

power means for urging said working face into intimate areal contact with said contoured surface to create a first seal means,

said housing means having at least one fuel inlet port, at least one fuel ignition means and at least one exhaust port whereby during the course of a revolution of the rotor means relative to the housing means, the first seal means, the power means, the respective ports, the ignition means and the fuel cavity cooperate to develop fuel compression, fuel ignition and exhaust functions,



said piston means including a plurality of cooperating piece parts defining a second seal means,

a first pair of piece parts including a first power means tending to separate said first pair of piece parts along a first axis to urge said piece parts into frictional contact with said cylinder means, and,

a second pair of piece parts including a second power means tending to separate said second pair of piece parts along a second axis to urge said piece parts into frictional contact with said cylinder means.

4,884,538
DIESEL ENGINE SWIRL CHAMBER

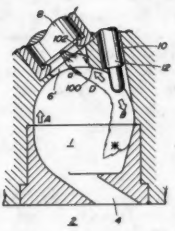
Toshiaki Tanaka, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 23, 1988, Ser. No. 159,338

Claims priority, application Japan, Mar. 6, 1987, 62-32815[U]

Int. Cl.[4] F02B *19/08*

U.S. Cl. 123—263 **9 Claims**



1. In an internal combustion engine:

a swirl chamber, said swirl chamber having a contour and being communicated with a main combustion chamber by way of a transfer passage, said transfer passage being arranged to introduce air into the swirl chamber during the compression phase of the engine thereby establishing a swirling air pattern therein;

means defining a nozzle throat through which a fuel plume is injected into said swirl chamber;

a means for deflecting a flame front which propagates back through the fuel plume following ignition thereof, comprising a deflecting surface located adjacent said nozzle

throat and arranged to prevent said flame front from propagating directly into said nozzle throat, said deflecting surface being arranged at an angle to said flame front and substantially parallel to said swirling air pattern;

wherein said nozzle throat has a wall portion oriented so as to be approximately normal to the swirling air pattern which is established in said swirl chamber; and

wherein the axis of the fuel injector and the axis of the nozzle throat are inclined with respect to each other, the axis of the fuel injector being angled less steeply with respect to the swirling air pattern which is established in said swirl chamber.

4,884,539

HEAD FOR AN INTERNAL COMBUSTION RECIPROCATING ENGINE

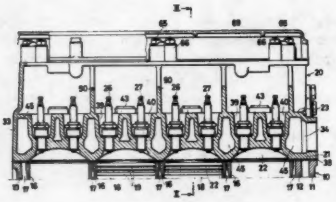
Angelo Ciccarone, Milan; Emilio Oldani, Cerro Maggiore, and Pier L. Scapecchi, Sarcano, all of Italy, assignors to Alfa Lancia Industries S.p.A, Arese, Italy

Filed Dec. 16, 1987, Ser. No. 133,881

Claims priority, application Italy, Dec. 17, 1986, 22733 A/86

Int. Cl.[4] F02F *1/42*; F02M *35/10*; F02P *15/02*

U.S. Cl. 123—310 **18 Claims**



1. A cylinder head for an internal combustion reciprocating engine which has cylinders, pistons and a circuit through which a cooling liquid is moved, said cylinder head having combustion chambers with a substantially semispherical shape, each combustion chamber having means for mounting a pair of spark plugs, each combustion chamber further having at least an intake valve and an exhaust valve positioned within respective intake and exhaust ducts, each intake valve and each exhaust valve of an associated combustion chamber being positioned with each axis inclined at an acute angle to a vertical axis of said associated combustion chamber, said means for mounting the pair of spark plugs holding the same pair of spark plug axes to lie on a second plane which is perpendicular to a first plane containing said axes of said intake and exhaust valves, said second plane being off-set to the center of said associated combustion chamber.

4,884,540

ENGINE SPEED CONTROL METHOD

Yuji Kishimoto, and Masanobu Uchinami, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

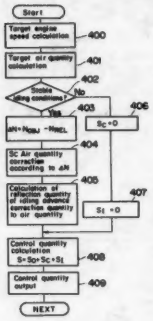
Filed Mar. 2, 1988, Ser. No. 163,019

Claims priority, application Japan, Mar. 9, 1987, 62-53618

Int. Cl.[4] F02D *41/16*

U.S. Cl. 123—339 **3 Claims**

1. In an engine speed control method including detecting a signal representing an error between an actual engine speed and a desired idling speed, and controlling both an ignition timing of an engine according to said error signal and at least one of an intake air quantity or an air/fuel mixture quantity to be admitted to said engine in order to make an engine speed equal to said desired idling speed; the improvement comprising the step of correcting said intake air quantity and said air/fuel mixture quantity to said engine according to an ignition timing error signal representing an error between an actual ignition



timing of said engine and an ignition timing predetermined in accordance with an engine operational condition.

4,884,541

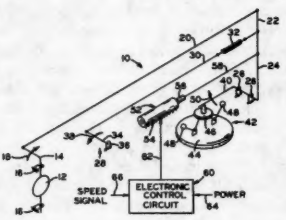
SPEED GOVERNOR FOR SMALL ENGINES

Lee W. Marriott, Ypsilanti, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 12, 1989, Ser. No. 296,489

Int. Cl.[4] F02D *11/10*

U.S. Cl. 123—361 **13 Claims**



1. A speed regulating apparatus for an internal combustion engine having a throttle valve the position of which affects the speed of the engine, comprising:

speed selecting means for selecting a desired speed for the engine;

speed monitoring means for determing the actual speed of the engine;

mechanical proportional control means, responsive to said speed selecting means and said speed monitoring means, for providing a mechanical output proportional to the difference between said desired speed and said actual speed, said mechanical output being operative to control the position of the throttle valve;

electronic integral control means, responsive to said speed selecting means and said speed monitoring means, for providing an electrical control signal output proportional to the time integral of the difference between said desired speed and said actual speed; and

electromechanical means, coupled to said throttle valve and having a control input connected to said electronic integral control means to receive said control signal output, for controlling the position of said throttle valve in dependence upon said electrical control signal output, whereby said mechanical control means provides proportional control of the position of the throttle valve and said elec-

tronic control means provides integral control of the position of the throttle valve.

4,884,542

FUEL-INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES, IN PARTICULAR FOR DIESEL ENGINES

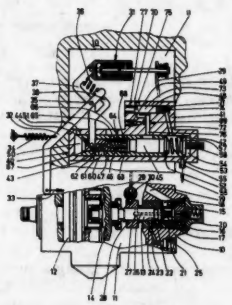
Karl Konrath, Freiberg; Claus Koester, Ditzingen; Karl Zibold, Asperg; Manfred Schwarz, Gerlingen; Karl-Friedrich Ruseler, Ditzingen; Klaus Krieger, Affalterbach, and Roland Kuprik, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 280,864

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741638

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—370 20 Claims



1. A fuel injection pump for Diesel engines provided with a housing having a pump piston, which draws fuel from a fuel-filled pump interior that is at feed pressure and pumps it at high pressure to injection nozzles; a quantity adjusting device the location of which relative to the pump piston determines the fuel injection quantity per pump piston stroke; a two-armed governor lever adapted to engage the quantity adjusting device with one of said arms adapted to actuate said adjusting device and with the other of said arms being coupled via at least one governor spring with an arbitrarily actuatable rpm adjusting lever that is pivotable counter to a restoring spring about a pivot shaft fixed on the pump housing; a damping device, comprising a cylinder for rpm adjustment, a piston and throttle that is axially displaceable in the damping cylinder, said damping device adapted to provide for delayed adjustment of the quantity adjustment device upon rapid actuation of the rpm adjusting lever to thereby improve the smoothness of engine operation, further in which said coupling between the rpm adjusting lever (32) and the governor spring (31) is performed via a pre-stressed drag spring (36), which is supported at one end thereof on the rpm adjusting lever (32) and on the other end thereof on a lever arm of a damper lever (37) which is connected to the governor spring (31), pivotable about a shaft (35) of the rpm adjusting lever (32) and thereby adapted to move the rpm adjusting lever (32) to contact a stop (38) on the damper lever (37) that is pivotably connected to the damping piston (44); said damping piston further including a throttle (47) which connects a damping chamber (45), enclosed by the damping piston (44) and the damping cylinder (41, 42, 43), with the pump interior (11) via a check valve (46) which has an open direction toward the damping chamber (45); and further that throttle (48) is adapted to connect the damping chamber (45) with the pump interior (11) via a further check valve (49) which is blocked toward the damping chamber (45).

4,884,543

FUEL INJECTION PUMP FOR COMBUSTION ENGINES

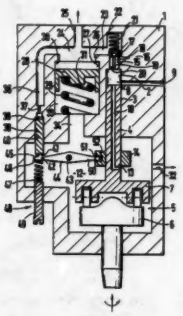
Heinz Stutzenberger, Vaihingen/Enz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 10, 1988, Ser. No. 269,335

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 37441868

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—387 10 Claims



1. A fuel injection pump including a housing (1), a cylinder bore (2) in said housing a pump piston (4) in said cylinder bore working chamber (8) formed by said piston and said cylindrical bore that communicates via a check valve with a reservoir (24), means for regulating fuel pressure in the reservoir (24), said means controlling a fuel quantity control slide (14) on said pump piston (4) to alter the quantity of fuel delivered from the working chamber (8) to the reservoir (24), a line (25) that leads from the reservoir (24) through a control site to a respective fuel injection site, a displaceable wall (28) that closes off said reservoir (24) from a cylindrical chamber (33), a control line (36) that extends from the reservoir (24) to a regulating cylinder (40), an adjustable regulating member (39) displaced in said regulating cylinder against a resetting force, and means for adjusting the fuel quantity control slide (14) according to the position of said adjustable regulating member.

4,884,544

CONTROL CABLE

William L. Sheppard, Romulus, Mich., assignor to Cable Manufacturing and Assembly Company, Inc., Fairfield, N.J.

Filed Apr. 12, 1988, Ser. No. 180,385

Int. Cl.[4] F02D *7/00*

U.S. Cl. 123—400 42 Claims

1. An engine throttle control comprising:

(a) a throttle valve;

(b) a return spring for normally maintaining said throttle valve in an engine-idle position;

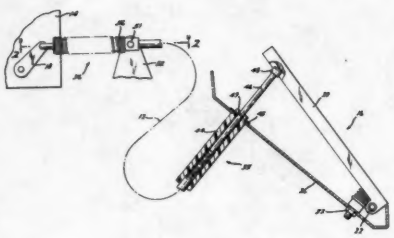
(c) an accelerator pedal;

(d) support means mounting said accelerator pedal for movement from an engine-idle position to an engine-full-throttle position, said support means normally maintaining said accelerator pedal in said engine-idle condition; and

(e) cable means operatively interconnected between said throttle valve and said accelerator pedal,

said cable means being movable in an advancing direction from and engine-idle position in response to movement of said accelerator pedal from its engine-idle position to

transmit engine accelerating forces applied to said accelerator pedal to said throttle valve to open same,



said support means returning said accelerator pedal to its engine-idle position independently of said cable means and said return spring.

4,884,545

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

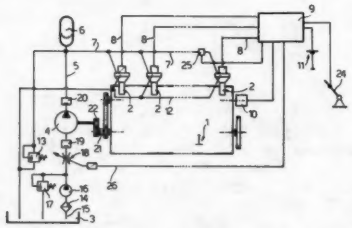
Christian Mathis, Arbon, Switzerland, assignor to Iveco Fiat S.p.A., Turin, Italy and Dereco Dieselmotoren Forschungs- und Entwick-lungs-AG, Arbon, Switzerland

Filed Jul. 6, 1988, Ser. No. 215,607

Claims priority, application Switzerland, Jul. 8, 1987, 02598/87

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—447 **8 Claims**



1. A fuel injection system for an internal combustion engine, particularly a Diesel engine, comprising injectors for each cylinder controlled by an electronic control device, and, upstream from the said injectors, a fuel accumulator supplying said injectors and itself supplied by a continuous-delivery fuel pump controlled as a function of engine speed and load; characterised in that, on the intake side of said pump, there is provided a throttle means for metering the amount of fuel supplied by said pump; and that, via operating signals, said throttle means is regulated mechanically and/or by said electronic control device in such a manner as to supply the said pump with no more than the required amount of fuel.

4,884,546

FUEL INJECTION CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

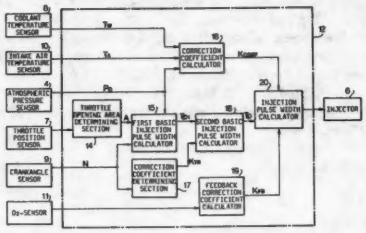
Yoshiyuki Sogawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1988, Ser. No. 266,918

Claims priority, application Japan, Nov. 10, 1987, 62-284559

Int. Cl.[4] F02D *41/04, 41/34*

U.S. Cl. 123—486 **2 Claims**



1. A system for controlling fuel injection of an engine for a motor vehicle having an intake passage, a throttle valve provided in the intake passage, and a fuel injector, the system comprising:

an engine speed sensor producing an engine speed signal dependent on speed of the engine;

a throttle position sensor producing a throttle position signal dependent on the opening degree of the throttle valve;

an atmospheric pressure sensor producing an atmospheric pressure signal;

first calculator means for producing a first basic injection pulse width signal in accordance with the engine speed signal, throttle position signal, and atmospheric pressure signal;

first memory means storing correcting coefficients dependent on engine speed;

means responsive to the engine speed signal for deriving a correcting coefficient from the first memory means; and

correcting means for correcting the first basic injection pulse width signal with the derived correcting coefficient and for producing a fuel injection pulse width signal for operating the fuel injector.

4,884,547

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH VARIABLE CONTROL CHARACTERISTICS DEPENDING UPON PRECISION LEVEL OF CONTROL PARAMETER DATA

Hideyuki Tamura, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Aug. 3, 1988, Ser. No. 227,834

Claims priority, application Japan, Aug. 4, 1987, 62-119319[U]

Int. Cl.[4] F02D *41/14;* F02M *51/00*

U.S. Cl. 123—489 **14 Claims**

1. An air/fuel ratio control system for an internal combustion engine, comprising:

first means for monitoring first engine driving parameter representative of basic fuel delivery control parameters to produce a first signal;

second means for monitoring oxygen concentration in an exhaust gas to produce a second signal;

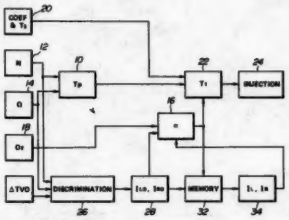
third means for monitoring third engine driving parameter representative of an engine driving condition and a third signal;

fourth means for deriving a basic fuel delivery amount on the basis of said first signal;

fifth means for deriving a correction value for correcting said basic fuel delivery amount on the basis of said oxygen

concentration, said correction value being variable according to a predetermined control characteristics; and

sixth means for detecting an engine driving condition satisfying a predetermined updating condition to generate fixed



value signals which defines a known control characteristic, obtaining said correction value derived with respect to said fixed value signals, and determining said control characteristic on the basis of said correction value obtained with respect to said fixed value signals.

4,884,548

FUEL INJECTION CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

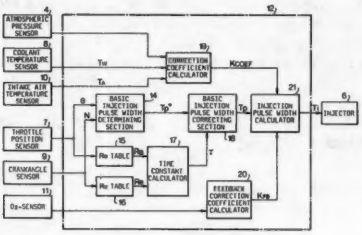
Yoshiyuki Sogawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1988, Ser. No. 266,917

Claims priority, application Japan, Nov. 10, 1987, 62-284556

Int. Cl.[4] F02D *41/10, 41/12*

U.S. Cl. 123—492 **2 Claims**



1. A system for controlling fuel injection of an engine for a motor vehicle having an intake passage, a throttle valve provided in the intake passage, and a fuel injector, the system comprising:

an engine speed sensor producing an engine speed signal dependent on speed of the engine;

a throttle position sensor producing a throttle position signal dependent on the opening degree of the throttle valve;

determining means for producing a basic injection pulse width signal in accordance with the engine speed signal and throttle position signal;

calculator means for producing a delay signal from variables dependent on the engine speed signal and the throttle position signal;

correcting means for correcting the basic injection pulse width signal with the delay signal and for producing a fuel injection pulse width signal for operating the fuel injector.

4,884,549

METHOD AND APPARATUS FOR REGULATING FUEL INJECTION TIMING AND QUANTITY

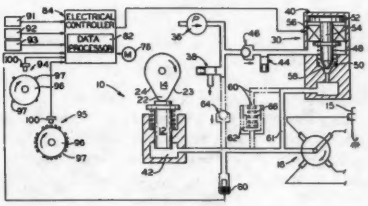
William W. Kelly, Granby, Conn., assignor to Stanadyne Automotive Corp., Windsor, Conn.

Continuation of Ser. No. 854,047, Apr. 21, 1986, Pat. No. 4,757,795. This application Jun. 8, 1988, Ser. No. 204,170

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—506 **28 Claims**



1. In an internal combustion engine fuel injection system having a charge pump with reciprocating pumping means and operating cam means providing periodic intake and pumping strokes of the pumping means to periodically receive an intake charge of fuel supplied at relatively low pressure and deliver fuel at relatively high pressure for injection of a charge of fuel, and regulating means for regulating the fuel injection timing and quantity of each injection charge of fuel, the improvement wherein the regulating means comprises electrical valve means connected to the charge pump and having open and closed positions and which, in the open position thereof, is operable to supply fuel to the charge pump during the intake stroke and to spill fuel from the charge pump during the pumping stroke, the electrical valve means being selectively electrically operable for selectively electrically opening and selectively electrically closing the electrical valve means, and control means actively governing the electrical operation of the electrical valve means during each intake stroke and during each pumping stroke, the control means selectively electrically closing the electrical valve means during each intake stroke to regulate the intake charge quantity of fuel supplied to the charge pump during each intake stroke and thereby regulate the fuel injection timing, the control means selectively electrically opening the electrical valve means during each pumping stroke to regulate the injected charge quantity by regulating the termination of said high pressure delivery of fuel.

4,884,550

INTERNAL COMBUSTION ENGINE

John H. Bird, Cobham, and Robin K. Waugh, Newbury, both of England, assignors to Economic Combustion Systems Limited, Corham, England

Filed Dec. 1, 1988, Ser. No. 278,461

Claims priority, application United Kingdom, Dec. 4, 1987, 8728427

Int. Cl.[4] F02M *23/08*

U.S. Cl. 123—587 **6 Claims**

1.An air and fuel mixing modulating and supply means for a spark ignition internal combustion engine comprising;

an inlet manifold for supplying air and fuel to the engine;

air and fuel metering means including a throttle; means connecting said air and fuel metering means to said inlet manifold;

a first valve means;

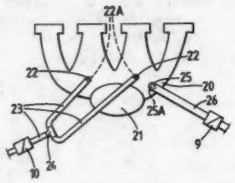
means defining a passage located the air and fuel metering means and the engine to said first valve means;

a second valve means;

means defining a second passage, located between the air

and fuel metering means and the engine and connected to said second valve means;

control means for controlling the valves including to determine the crankshaft speed of the engine, the arrangement being such that when the crankshaft is greater than a



predetermined valve the control causes the second valve means to open to allow additional air to enter the air inlet manifold to enhance combustion, and on a reduction in crankshaft speed the control means causes the first valve means to open, to relieve engine vacuum.

4,884,551

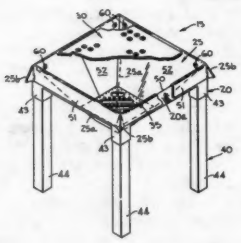
OUTDOOR COOKING UNIT

Paul W. Hait, Los Gatos, Calif., assignor to Pyromid, Inc., Redmond, Oreg.

Continuation-in-part of Ser. No. 726,835, Apr. 24, 1985. This application Dec. 12, 1988, Ser. No. 283,497

Int. Cl.[4] F24C *1/16*

U.S. Cl. 126—9 R 25 Claims



1. A cooking unit comprising:

(a) a horizontal support with an opening therethrough;

(b) a cooking grill disposed over said opening in said horizontal support;

(c) a firebox vessel having an open top and a closed bottom, said firebox vessel being supported within said opening of said horizontal support in depending relation by said horizontal support and disposed below said cooking grill, said firebox vessel including flanges along the perimeter thereof engaging said horizontal support for said horizontal support to support said firebox vessel within said opening of said horizontal support in depending relation, said firebox vessel being formed with at least one opening for the entry of combustion air into said firebox vessel; and

(d) a fire grate for supporting a fuel element disposed within said firebox vessel below said opening of said firebox vessel,

(e) combustion air enters said firebox vessel above said fire grate through the opening formed in said firebox vessel and flows below said fuel element for supplying combustion air to the fuel element on said fire grate.

4,884,552

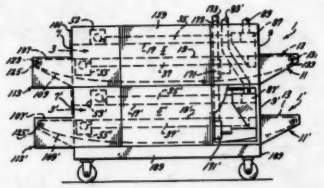
GAS OVEN

Kelley J. Wells, 6424 Stillhouse La., High Ridge, Mo. 63049, and Everett F. Graham, 23135 Commerce Dr., Farmington Hills, Mich. 48024

Filed Feb. 26, 1988, Ser. No. 160,675

Int. Cl.[4] A21B *1/00*

U.S. Cl. 126—19 R 12 Claims



1. Apparatus for baking food products comprising:

(a) an elongate tunnel defining an oven, the tunnel having an opening at one end for placing food products into the oven and an opening at the other end for removing baked food products;

(b) conveyor means for conveying food products from the one end of the tunnel to the other;

(c) combustion means for combusting gases supplied to the apparatus;

(d) upper and lower longitudinally extending duct means to which the heat from the combustion of gases is directed, the upper duct means including a lower portion operatively defining an upper tunnel wall and providing an upper hearth means and the lower duct means including an upper portion operatively defining a lower tunnel wall and providing a lower hearth means, the upper and lower hearth means radiating heat imparted thereto downwardly and upwardly respectively, onto the food product as it passes through the tunnel, whereby the food product is baked;

(e) temperature sensing means for sensing the heat radiated from the upper and lower hearth means and operatively controlling gas combustion;

(f) a heat exchanger means for distribution of the heat of combustion to the upper and lower heating duct means; and

(g) exhaust means exhausting gasses from the duct means to ambience.

4,884,553

DEVICE FOR HEAT-TREATING FOOD ITEMS

Werner Schwarzbäcker, Untereglfing, Fed. Rep. of Germany, assignor to Convotherm Elektrogerate GmbH, Untereglfing, Fed. Rep. of Germany

Filed Nov. 23, 1987, Ser. No. 123,686

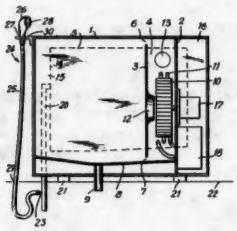
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1986, 8631399; Jul. 6, 1987, 3722282

Int. Cl.[4] A21B *1/08*

U.S. Cl. 126—20 9 Claims

1. In a device for heat-treating food items having means for providing vapor or a vapor/hot air mixture in a cooking chamber closable with a door, the improvement comprising a squirting or spraying device insertable into the cooking chamber for rinsing and cleaning it; said spraying device including a spraying head in the form of a hand-held shower and a flexible

supply line, which connects the spraying head with a water connection, said water connection being provided on the de-



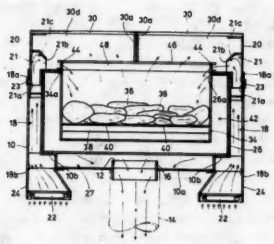
vice outside the cooking chamber, said water connection also providing a source for said vapor.

4,884,554

SPIT ROASTER

Satoshi Yanagida, Nagoya, Japan, assignor to Yanagen Company Ltd., Nagoya, Japan

Filed Aug. 3, 1988, Ser. No. 227,855
Claims priority, application Japan, Apr. 5, 1988, 62-84867
Int. Cl.[4] F24C *15/32*; A47J *37/00*
U.S. Cl. 126—21 R **15 Claims**



1. A spit roaster, comprising:

an outer housing having a substantially rectangular parallelepiped configuration defined by means of a bottom wall, upstanding end walls connected at lower portions thereof to said bottom wall, and upstanding front and rear walls connected at lower portions thereof to said bottom wall and also having side edge portions connected to corresponding side edge portions of said upstanding end wall;

a range housing, disposed within said outer housing, having a substantially rectangular paarallelepiped configuration defined by means of a bottom wall, upstanding end walls connected at lower portions thereof to said bottom wall, and upstanding front and rear walls connected at lower portions thereof to said bottom wall and also having side edge portions connected to corresponding side edge portions of said upstanding end walls;

a range, disposed within said range housing, having a substantially rectangular parallelepiped configuration defined by means of a bottom wall for supporting cooking charcoal, upstanding end walls connected at lower portions thereof to said bottom wall, and upstanding front and rear walls connected at lower portions thereof to said bottom wall and also having side edge portions connected to corresponding side edge portions of said upstanding end walls;

air supply means defined within said end walls of said outer housing for introducing outside combustion air into said range for combustion of said cooking charcoal disposed within said range;

exhaust duct means defined within said bottom wall of said outer housing for exhausting smoke, generated during a cooking operation, from said range to a location external to said roaster;

means defining a smoke exhaust flow path within a rear portion of said roaster and fluidically connecting said range to said exhaust duct means for conducting said smoke, generated within said range during said cooking operation, from said range to said exhaust duct means; and

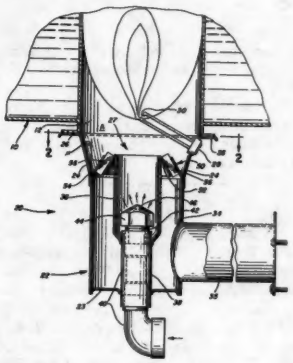
means fluidically connected with said exhaust duct means for generating a negative pressure within said exhaust duct means so as to exhaust said smoke, generated within said range during said cooking operation, through said smoke exhaust flow path and said exhaust duct means to said location external to said roaster.

4,884,555

SWIRL COMBUSTER BURNER

Vincent M. S. Huang, Brookfield, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Nov. 21, 1988, Ser. No. 274,471
Int. Cl.[4] F24H *1/00*
U.S. Cl. 126—350 R **9 Claims**



1. An improved high efficiency swirl combuster burner for heating liquid within a tank having a combustion chamber, said burner comprising;

a burner body having an inlet for combustion air;

a diverging burner flange tapering from the burner body to the tank;

an inner gas chamber located within said burner body;

a gas piping train passing through the burner body terminating at an end within the inner gas chamber;

a nozzle having openings angled toward the wall of the inner gas chamber connected to the end of the gas piping train;

an air swirl cone located between the burner body and inner gas chamber; and

an ignition and flame sensing means mounted on the burner body and protruding into the combustion chamber.

4,884,556

ZERO CLEARANCE FIREPLACE

Frank Alden, Marlboro, Mass., and James A. Wyatt, Randolph, Vt., assignors to Vermont Castings, Inc., Randolph, Vt.

Continuation of Ser. No. 25,528, Mar. 13, 1987, abandoned. This application Nov. 17, 1988, Ser. No. 274,715
Int. Cl.[4] F24B *7/00*
U.S. Cl. 126—546 **9 Claims**

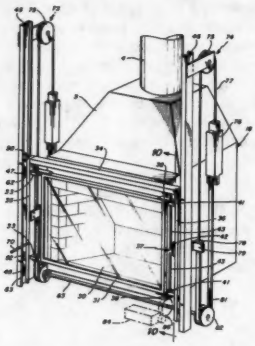
1. A fireplace construction having means for selectively

sealing the room opening in the front of a combustion chamber in said fireplace comprising:

a door sized and shaped for positioning over said opening,

guide means engaging said door for guiding vertical movement of said door between a lowered position over the opening in said front of said fireplace and a raised position vertically displaced therefrom,

means supporting said door for movement in said guide means,



means for moving said support means and door to said raised position unless said door is secured in said lowered position, and

means for selectively securing said door in said lowered position, including means for releasing said door from said lowered position when it is pushed outwardly from within the combustion chamber.

4,884,557

ENDOSCOPE FOR AUTOMATICALLY ADJUSTING AN ANGLE WITH A SHAPE MEMORY ALLOY

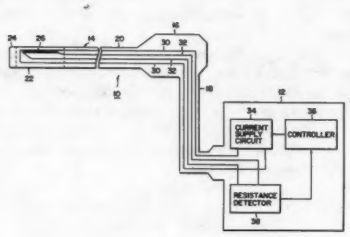
Sakae Takehana; Yasuhiro Ueda, and Tomohisa Sakurai, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 11, 1988, Ser. No. 193,294

Claims priority, application Japan, May 15, 1987, 62-118308; May 25, 1987, 62-127721; Aug. 5, 1987, 62-194300; Sep. 11, 1987, 62-227585; Oct. 8, 1987, 62-254171; Apr. 12, 1988, 63-91091

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **46 Claims**



1. An endoscope device comprising:

an endoscope body including bending means having a shape memory alloy disposed therein; and

an external device detachably connected to said endoscope body and including current supply means for supplying current to said shape memory alloy via a current supply wire means to heat said shape memory alloy, means for detecting the resistance of said shape memory alloy, means for controlling said current supply means based on the resistance detected by said detecting means, and

said detecting means including means for detecting the resistance of said shape memory alloy by use of a wire means other than said current supply wire means.

4,884,558

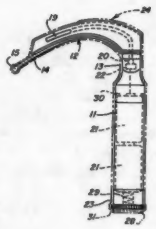
LARYNGOSCOPE ASSEMBLY INCLUDING DISPOSABLE PROTECTIVE ENCLOSURE

Lawrence J. Gorski, and Nancy G. Gorski, both of Camarillo, Calif., assignors to Gorsk, Inc., Camarillo, Calif.

Filed Nov. 20, 1987, Ser. No. 123,204

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—11 **8 Claims**



1. In a laryngoscope assembly, the combination comprising

(a) a laryngoscope handle;

(b) a laryngoscope blade;

(c) a connector fitting attaching said blade to said handle;

(d) a light source mounted on said blade and powered from battery means in said handle;

(e) a disposable, fluid impervious, elastic safety enclosure adapted to be stretched longitudinally and diametrically over said blade, said connector fitting, and said handle;

(f) said safety enclosure being sufficiently light permeable to permit illumination of the larynx and trachea during use of said laryngoscope assembly; and

(g) said safety enclosure having an annular extension overlapping the bottom cap of said handle and terminating in an elastic bead of substantially smaller diameter than said handle to retain said safety enclosure in place on said handle.

4,884,559

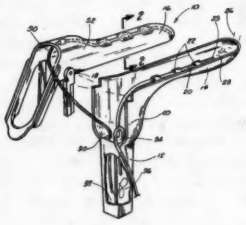
SURGICAL SPECULUM

Jason H. Collins, 1344 Covington Hwy., Slidell, La. 70460

Filed Dec. 4, 1987, Ser. No. 128,635

Int. Cl.[4] A61B *1/32*

U.S. Cl. 128—17 **4 Claims**



1. A cervical speculum, comprising:

(a) an upper blade member;

(b) a lower blade member in substantial parallel relationship with the upper blade member;
(c) a handle member;
(d) means related to the handle member for moving said upper and lower blade members between open and closed positions relative to one another;
(e) first and second tube means positioned in said upper and lower blade members respectively, the first tube means having a first end portion for evacuating smoke and the second tube means for evacuating fluid during cervical surgery while housed in said upper and lower blade members respectively; and
(f) trap means positioned in the handle member for receiving said fluid and smoke evacuated during the cervical surgery.

4,884,560

THERMAL MASSAGE DEVICE

Thomas C. Kuracina, 15974 Maricopa Hwy., Ojai, Calif. 93023

Filed Jul. 11, 1988, Ser. No. 217,546
Int. Cl.[4] A61H *29/00*
U.S. Cl. 128—24.3 **17 Claims**

1. A thermal massage device comprising:
an elongated member having a hollow interior containing a thermal medium, said member having a first end sealed with a first closure means and a second end sealed with a second closure means;
a first gripping sleeve slidably encircling said member proximate said first end;
a second gripping sleeve slidably encircling said member proximate said second end; and,
handle means adjacent said second end for manually supporting said device comprising an elongated bar pivotally attached to said second gripping sleeve.

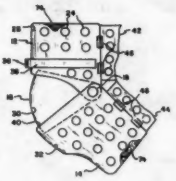
4,884,561

ARTICULATED BRACE FOR PROTECTION OF THE JOINT OF A WEARER'S LIMBS

Billy R. Letson, Sr., Rte. 2, Box 533, Trinity, Ala. 35673

Filed Jun. 1, 1987, Ser. No. 55,949
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—77 **14 Claims**

1. An articulated brace having a pivotally mounted joint engaging portion for protection of the joint of a wearer's limbs, such as a knee or elbow, and comprising:
an upper, arcuate, shell-like section for attachment to the upper portion of a wearer's limb;
a lower, arcuate, shell-like portion for attachment to the lower portion of a wearer's limb;
an intermediate cupped section pivotally secured to and mounted inside said arcuate upper and lower sections in nestled relation therewith, said intermediate cup-shaped section disposed in contiguous relation with the joint of said wearer's limb even during movement thereof;
pivotally securing means for pivotally securing said upper, lower, and intermediate sections together, whereby said



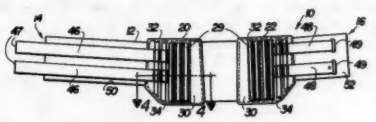
intermediate section retains the joint of said wearer's limb therein in nestled relation even during movement of said joint; and
stop means for limiting the movement of said upper, lower, and intermediate sections.

4,884,562

SUSPENSION BRACE ASSEMBLY

Mario M. Stone, 333 Arthur Godfrey Rd., Miami Beach, Fla. 33140

Continuation of Ser. No. 740,654, Jun. 3, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 945,178
Int. Cl.[4] A61F *5/02*
U.S. Cl. 128—78 **7 Claims**



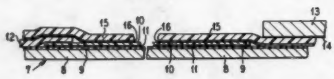
1. A suspension brace assembly for supporting and stabilizing the lumbosacral portion of the spine of a wearer by suspending the wearer's spine and restricting lateral bending of the wearer's torso, the combination comprising:
a foundation for surrounding the wearer's torso about the area of the lower back;
means, coupled to said foundation, for tightening said foundation about the wearer's torso; and
first and second lateral support assemblies coupled to said foundation and spaced laterally along said foundation at positions to engage the side portions of the wearer's torso for suspending the wearer's spine and for restricting lateral bending of the lumbosacral portion of the wearer's spine, each of said first and second lateral support assemblies including
a plurality of substantially rigid brace elements, each of said brace elements having a length sufficient for suspending the wearer's spine by applying tension forces thereto, and having an upper end engaging lower ribs of the wearer and a lower end engaging the iliac crest and greater trochanter of the wearer's torso to suspend the lower portion of the wearer's spine and to restrict lateral bending of the lumbosacral portion of the wearer's spine.

4,884,563

NON-STRETCHING WOUND DRESSING AND METHOD FOR MAKING SAME

Robert W. Sessions, Hinsdale, Ill., assignor to Ferris Mfg. Corp., Burr Ridge, Ill.

Continuation-in-part of Ser. No. 707,233, Mar. 1, 1985, abandoned. This application Nov. 12, 1985, Ser. No. 797,777
Int. Cl.[4] A61F *13/00, 15/00*
U.S. Cl. 128—155 38 Claims



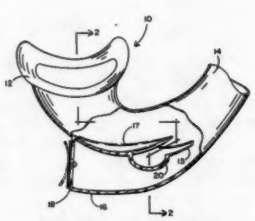
1. A non-stretching wound dressing comprising:
a carrier sheet;
a film sheet having an adhesive layer on one side thereof adjacent said carrier sheet;
a cover sheet adhered to said film sheet;
a first gripping tab separate from and directly attached to one end of said cover sheet for separating said carrier sheet from said film sheet with the cover sheet remaining affixed thereto, said adhesion between said cover sheet and said film sheet being selected such that pulling said first tab releases said film sheet from said carrier sheet with the cover sheet remaining affixed to said film sheet;
a second gripping tab separate from and directly attached to an opposite end of said cover sheet for releasing said cover sheet from said film sheet, said adhesion between said cover sheet and said film sheet being further selected such that after application of the adhesive side of said film sheet to a patient, pulling on said second tab releases said cover sheet from said film sheet with said film sheet remaining in place on said patient.

4,884,564

SNORKEL

Mark D. Lamont, Long Beach, Calif., assignor to Undersea Industries, Inc., Rancho Dominguez, Calif.

Filed Jul. 25, 1988, Ser. No. 223,547
Int. Cl.[4] A62B *7/00*
U.S. Cl. 128—201.11 7 Claims



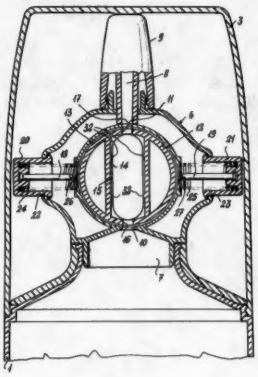
1. An improved snorkel of the type having a main conduit and a bypass conduit separated from the main conduit by a partition, the main conduit terminating in a mouthpiece at one end and terminating in a breathing tube at the other end, the bypass conduit terminating in a purge valve for permitting a diver to purge water from the snorkel with reduced exhalation effort; the improvement comprising:
a trough-shaped depression in said partition, said depression having a wall extending toward said bypass conduit and having an aperture for promoting draining of water from said main conduit into said bypass conduit;
said partition and bypass conduit being positioned to be below said mouthpiece when said breathing tube is substantially vertical whereby said aperture is also below said mouthpiece.

4,884,565

INSUFFLATOR FOR THE ADMINISTRATION OF DRUGS IN THE FORM OF A POWDER PRE-DOSED INTO OPERCOLA

Salvatore Cocozza, Milan, Italy, assignor to Mist S.p.A., Milan, Italy

Filed Jul. 27, 1988, Ser. No. 224,816
Claims priority, application Italy, Aug. 17, 1987, 21668 A/87
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—203.21 11 Claims



1. Insufflator for the administering drugs which are in the form of a powder pre-dosed into opercola, the insufflator comprising a body having an air-inlet opening coaxial with a substantially vertical outlet channel for carrying inlet air mixed with the powder drug, and a device with opposite substantially horizontal reciprocating pins for puncturing an operculum, said operculum being placed in a seat having two axially opposite holes, and characterized in that the seat for the operculum is provided in a member that is turnable relative to said body, and in that said turnable member can take at least two different positions: a first position, or operculum puncturing position, where the operculum is axially puncturable by the two opposite, substantially horizontal reciprocating pins through said two axially opposite holes in the seat; and a second position, or delivery position, that is substantially turned 90° relative to said first position, in which one of said axially opposite holes is coaxial with said air-outlet channel, and the other one of said axially opposite holes is in communication with the air-inlet opening.

4,884,566

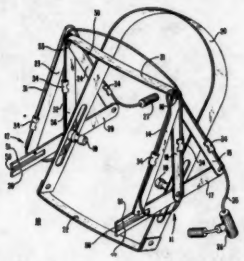
SYSTEM AND METHOD FOR DETERMINING ORIENTATION OF PLANES OF IMAGING

James M. Mountz, Ann Arbor, and Mark W. Wilson, Detroit, both of Mich., assignors to The University of Michigan, Ann Arbor, Mich.

Filed Apr. 15, 1988, Ser. No. 181,902
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—303 B 17 Claims

1. An apparatus for defining the location of an image plane of an image through a selected portion of the body of a being, the apparatus comprising:
a plurality of elongated channel sections for containing a material which is visible in the image;
first carrier means for supporting a first predetermined number of said elongated channel sections in respective orien-

tations transverse to the image plane and in predetermined space relation with respect to one another, said first carrier means being provided with respective first and second carrier portions for supporting respective ones of said plurality of elongated channel sections therealong, said first and second carrier portions being coupled to one



another at respective first ends thereof, and to a base member at respective second ends, said first and second carrier portions and said base member forming a triangle, and a third carrier portion arranged substantially to bisect said triangle; and

support means for maintaining said first carrier means in fixed spatial relation to the body of the being.

4,884,567

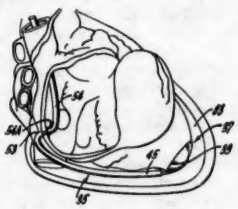
METHOD FOR TRANSVENOUS IMPLANTATION OF OBJECTS INTO THE PERICARDIAL SPACE OF PATIENTS

Clyde D. Elliott, Mountain Brook, Ala., and Donald M. Cohen, Encino, Calif., assignors to Dimed Inc., Birmingham, Ala. and Siemens- Pacesetter, Inc., Sylmar, Calif.

Filed Dec. 3, 1987, Ser. No. 128,326

Int. Cl.[4] A61B *17/00*

U.S. Cl. 128—303 R **14 Claims**



1. In a patient, a method for the transvenous implantation of a device through a vein having a lumen into a pericardial space surrounding a cardium having an atrium and an atrial lateral wall comprising:

entering the vein;

translating through the vein lumen to the atrium;

anchoring onto the atrial lateral wall;

puncturing the atrial lateral wall and forming a hole therein;

exiting the atrium through the hole to the pericardial space; and

inserting the device into the pericardial space.

4,884,568

RADIATION COAGULATOR

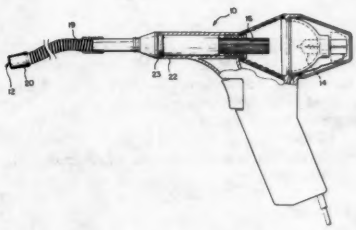
Andreas Hahn, Sauerlach, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 202,146

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 3723227

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 **6 Claims**



1. A radiation coagulator having a radiation source which has a large infrared content disposed in a coagulator housing, further having a light conductor mounted in a holding tube attached to the housing and having a sleeve-like cap which is placed at the radiation exit end of the light conductor on the holding tube, with which cap a spot of tissue to be coagulated is brought into contact, and further wherein:

the light conductor comprises a bundle of individual fibers;

the holding tube is flexible;

the sleeve-like cap is snapped onto the holding tube;

and at least the region of the sleeve-like cap which comes into contact with the tissue spot to be coagulated comprises silicone rubber, said sleeve-like cap having a light exit window also comprising said silicone rubber.

4,884,569

DEVICE FOR OPHTHALMOLOGIC OPERATIONS

Svyatoslav N. Fedorov; Sergei A. Soloviev; Evgeny I. Degtev; Albina I. Ivashina, and Alexandr A. Karavaev, all of Moscow, U.S.S.R., assignors to Mezhotraslevoi Nauchno-tekhnichesky Komplex "Mikrokhirurgia Glaza", Moscow, U.S.S.R.

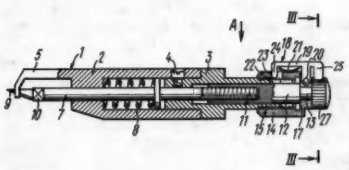
PCT No. PCT/SU86/00028, § 371 Date Nov. 23, 1987, § 102(e) Date Nov. 23, 1987, PCT Pub. No. WO87/05799, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 31, 1986, Ser. No. 162,334

Claims priority, application U.S.S.R., Jul. 5, 1983, 3615522

Int. Cl.[4] A61B *17/32*

U.S. Cl. 128—305 **4 Claims**



1. A device for ophthalmologic operations comprising a holder (1), a stop (5) arranged on said holder at one end of the holder for interacting with a surface of an eye cornea during an operation, a cutting instrument (9) with a catch (10) secured on one end of a spring-loaded rod (7) which is accommodated

inside the holder (1) and carries a micrometric thread (11) on its other end for moving said rod inside the holder (1), a nut (13) interacting with the rod (7) for moving the latter by rotation of the nut, a thrust bushing (14) threaded on the holder (1) by means of a further micrometric thread (15) at an end of the holder opposite to the stop (5), and a further catch (18) releasably fixing the position of the thrust bushing (14) relative to the holder (1), said further catch (18) being mounted on the thrust bushing (14) and being releasably engageable with the nut (13) so as to allow rotation of the nut when disengaged therefrom and prevent rotation of the nut when engaged therewith.

4,884,570

DEVICE FOR RETAINING A DISC OBTAINED FROM A HUMAN CORNEA

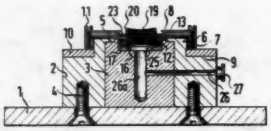
Jorg H. Krumeich, Bochum, and Norbert Quast, Essen-Kray, both of Fed. Rep. of Germany, assignors to EyeTech AG, Liechtenstein, Liechtenstein

Filed Mar. 15, 1985, Ser. No. 712,249

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409798

Int. Cl.[4] A61B *17/32*

U.S. Cl. 128—305 **22 Claims**



21. Apparatus to retain a corneal disc of a human cornea for altering the surface of the corneal disc by transverse planar cutting of the exposed corneal surface, said apparatus including the combination of

a rigid support member,

a molding carried by said rigid support member for supporting a corneal disc, said molding having a corneal support surface defining a predetermined convex or concave curvature to shape the corneal disc for a transverse planar cut according to a required refractive power,

means for releasably holding said corneal disc on said molding, and

a guideway means carried by said rigid support member positioned remote to said disc receiving surface for relative movement of a cutter transversely of said corneal disc while held on said molding.

4,884,571

CRANIAL PERFORATOR WITH REENTRANT CUTTING SEGMENT

John W. Baker, Acton, Mass., assignor to Intech, Inc., No. Acton, Mass.

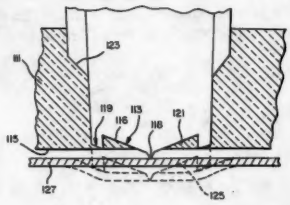
Continuation-in-part of Ser. No. 575,571, Jan. 31, 1984, Pat. No. 4,600,006. This application Sep. 30, 1985, Ser. No. 781,933

Int. Cl.[4] A61B *17/16*

U.S. Cl. 128—310 **9 Claims**

1. A drilling implement for drilling holes in bone structures comprising, a drill head assembly including inner and outer coaxial drill members with the inner member having at least one drilling flute with a forward cutting edge, and with each cutting edge including a reentrant cutting segment spaced axially rearward from the outer end of said forward cutting edge and extending inwardly toward the axis of said drill members whereby a disk-like configuration from the bone structure is formed as the inner drill penetrates through the bone structure.

6. A drilling implement for drilling holes in bone structures comprising a drill head assembly, including inner and outer coaxial drill members with the inner member having at least one drilling flute with a forward cutting edge, each said cutting edge including means for cutting a wafer having a disc-like



configuration from the bone structure as the inner drill member penetrates through the bone structure by an annular cut.

4,884,572

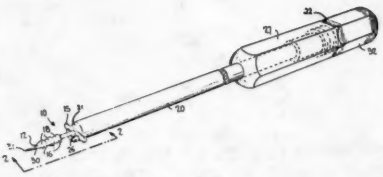
TACK AND APPLICATOR FOR TREATING TORN BODILY MATERIAL IN VIVO

F. Barry Bays, Seminole; Arthur F. Trott, Largo, and Sam R. Marchand, Dunedin, all of Fla., assignors to Concept, Inc., Largo, Fla.

Division of Ser. No. 865,184, May 20, 1986, abandoned. This application May 16, 1988, Ser. No. 194,091

Int. Cl.[4] A61B *17/04;* B26B *11/00;* F16B *19/00;* B25B *13/16*

U.S. Cl. 128—334 R **13 Claims**



1. Apparatus for treating torn bodily material in vivo comprising:

an applicator having a forward end, a rearward end and an applicator bore therein;

a tack member formed entirely of biodegradable material and having a proximal end, a distal end, a shaft portion and a grip portion, said grip portion being disposed at said proximal end, said shaft portion extending from said [cross bar] grip portion to said distal end and constituting most of the length of said tack member, said shaft portion having at least one barb member projecting radially therefrom and tapered to facilitate insertion of said shaft portion longitudinally into said bodily material in a first direction extending from said proximal end toward said distal end and to restrict movement of said shaft portion through said bodily material in a second direction opposite said first direction, said tack member having a tack bore defined longitudinally therethrough from said proximal end to said distal end;

retainer means for releasably engaging said grip portion of said tack member at said forward end of said applicator to preclude axial displacement between said applicator and said tack member, said tack member being engaged in an orientation wherein said tack bore is axially aligned with said applicator bore; and

an insertion needle slidably extending [entirely] through said applicator bore and said tack bore and having a sharp-pointed insertion end projecting forwardly beyond the distal end of said tack member;

whereby, upon insertion of said insertion needle and said tack member through torn parts of said bodily material, followed by retraction of said needle into said applicator

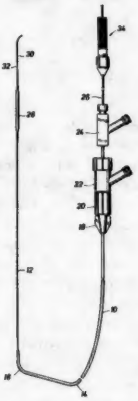
bore and out of said tack bore, and further followed by disengagement of said grip portion of said tack member by said retainer means, said tack member is prevented from retracting by said barb member and remains inserted through said torn parts of bodily material to dissolve after said torn parts heal.

4,884,573

VERY LOW PROFILE ANGIOPLASTY BALLOON CATHETER WITH CAPACITY TO USE STEERABLE, REMOVABLE GUIDEWIRE

Bandula Wijay, Friendswood, and Paolo Angelini, Houston, both of Tex., assignors to Leocor, Inc., Webster, Tex.

Filed Mar. 7, 1988, Ser. No. 164,870
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—344 **7 Claims**



1. An angioplasty balloon catheter assembly, comprising:
a balloon-tipped, very low profile catheter made of plastic material having a tensile strength of at least 10,000 psi and including outer and inner coaxial tubes, defining an outer access annular passageway therebetween for inflating and deflating said balloon and an inner access annular passageway;
and a movable and steerable and removable guidewire received in said inner access annular passageway;
wherein the wall thicknesses of said outer and coaxial tubes are not more than about 0.001 inch.

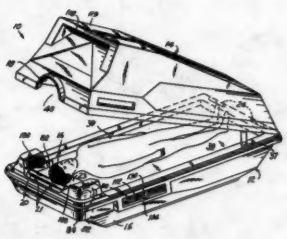
4,884,574

VIBRATORY SAUNA

Laurie S. Hardie, 8 View Avenue, Surfers Paradise, Queensland, and Leonard J. Coleman, 5 Seafarer Court, Paradise Waters, Queensland, both of Australia 4217

Division of Ser. No. 772,726, Sep. 4, 1985, Pat. No. 4,712,538, which is a continuation-in-part of Ser. No. 551,958, Nov. 15, 1983, Pat. No. 4,565,188. This application Dec. 8, 1987, Ser. No. 130,075
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[4] A61H *33/06*
U.S. Cl. 128—373 **20 Claims**

8. A sauna comprising:
a housing including a lower housing member and an upper closure member forming a cover member rotatably connected to said lower housing member, said lower housing member including a base,
a support member mounted on said lower housing member oriented in a substantially horizontal plane for supporting the torso of a person in a supine position,
head support means located adjacent to said lower housing member and outwardly of said closure member to form a longitudinal extension of said support member,
said cover member forming an upper compartment, said torso being positioned in said compartment,
said lower housing member forming a chamber below said support member,
heating means for heating ambient air,
airflow generation means for forcing heated and ambient air, and



chamber means positioned within and sealed from said chamber, said heating means being positioned in said chamber means, and said airflow generation means being associated with at least one inlet and at least one outlet of said chamber means, said chamber means being for receiving ambient air from said compartment at said inlet and passing said ambient air to said outlet back to said compartment in a flow of air as one part of a continuous closed circulation of air in said housing, said continuous closed circulation including a flow of heated air above said support member to contact the person lying thereon while said support member is adapted to be simultaneously vibrated, the other part of said continuous closed circulation of air being a flow of heated air above the person.

4,884,575

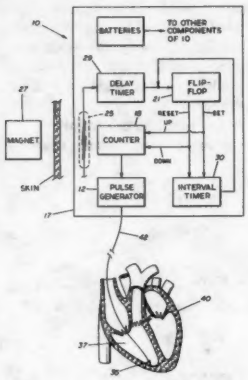
CARDIAC PACER WITH PATIENT-CONTROLLED EXERCISE RATE AND METHOD

Richard S. Sanders, Houston, Tex., assignor to Intermedics, Inc., Angleton, Tex.

Filed Dec. 8, 1987, Ser. No. 130,182
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **15 Claims**

1. In combination with an implantable cardiac pacemaker for delivering electrical stimuli to the heart of a patient to pace the heart rate,
said pacemaker comprising:
pulse generator means for selectively producing said electrical stimuli at a fixed resting rate and at a higher exercise rate,
lead means associated with said pulse generator for delivering said stimuli to a selected chamber of the heart, and
timer means for stepping-up said pulse generator means from said resting rate to said exercise rate after an adjustable preset delay following activation of said timer means, said

preset delay being of a duration perceptible by the patient; and



external control means for patient initiation of a first command to said pacemaker to activate said timer means.

4,884,576

SELF ADJUSTING RATE RESPONSIVE CARDIAC PACEMAKER AND METHOD

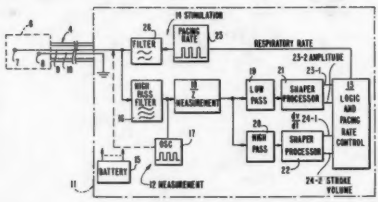
Eckhard Alt, Eichendorffstrasse 52, 8012 Ottobrunn, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,242

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732640

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PG **16 Claims**



1. The method of relating the pacing rate for a patient's heartbeat comprising the steps of:

producing in response to activity of the patient at least one on-line real-time signal sensed by monitoring the dynamic activity of the patient,

developing from said signal a long term average indicating the condition of the patient representative of the patient's basic cardiopulmonary condition,

establishing a basic base line characteristic relationship to the long term average from said signal as the primary pacing signal for control of the patient's heartbeat,

establishing a short term average from the real-time signal representative of the patient's instantaneous cardiopulmonary condition,

varying the base line characteristic upward and downward as a function of the short term average to produce a dynamically modified pacing control signal incorporating both said long term average and said short term average, and

pacing the patient's heartbeat as a function of the dynamically modified pacing control signal.

4,884,577

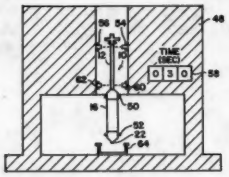
PROCESS AND APPARATUS FOR MEASURING BLOOD VISCOSITY DIRECTLY AND RAPIDLY

Edward W. Merrill, 90 Somerset St., Belmont, Mass. 02178

Continuation of Ser. No. 666,653, Oct. 31, 1984, abandoned. This application Jul. 1, 1985, Ser. No. 750,897

Int. Cl.[4] A01B *10/00*

U.S. Cl. 128—637 **7 Claims**



1. Apparatus for measuring blood viscosity which comprises a hollow column in fluid communication with a chamber containing a porous bed having pores of a size between about 10 μm and about 200 μm, the permeability (B_o) of said bed, the length, L of said bed and the pressure gradient across said bed ($\Delta P/L$) being such that the average wall shear stress defined as $(\Delta P/L)\sqrt{2}\,B_o$ is about 1 dyn/cm^2 or less when blood is passing through said bed during the course of viscosity measurement, said hollow column having an inlet at a first end of said column and an outlet at a second end of said column and said chamber having a chamber inlet at a first end of said chamber and in fluid communication with the column outlet and a chamber outlet at a second end of said chamber to permit blood flow through said column and said chamber and means for measuring the flow rate of blood through said chamber.

4,884,578

APPARATUS FOR MONITORING RESPIRATION AND CARDIAC ACTIVITY

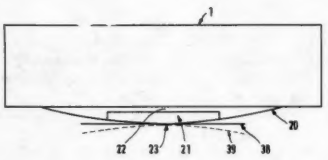
Jurgen Morgenstern, Im Heidewinkel 33, 4000 Dusseldorf, Fed. Rep. of Germany

Division of Ser. No. 917,429, Oct. 10, 1986, abandoned. This application Aug. 10, 1988, Ser. No. 230,690

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1985, 3536491

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—670 **1 Claim**



1. An apparatus for monitoring respiration and cardiac activity of a patient, comprising:

bed means for supporting thereon a patient to be monitored, the bed means having a base and an edge;

mounting means for mounting the bed means for polydirectional movement about a initial position thereof, the mounting means comprising a curved point-contact bearing provided on the base of the bed means and directed downwardly therefrom, said curved point-contact bearing

being supported at a bearing point thereof by support means;

restoring means for restoring the bed means to said initial position, the restoring means comprising a weight provided inside the curved point-contact bearing and arranged such that the position of a common center of gravity of the bed means, the curved point-contact bearing and said weight is located for biasing the bed means towards said initial position when disturbed therefrom;

first sensor means located proximate said curved point-contact bearing bearing point and oriented in a first direction for sensing movement of the bed means in said first direction caused by heartbeat and respiration pulses originating from a patient being monitored; and

at least one second sensor means provided on said bed means and oriented towards the edge of the bed means in a second direction different from said first direction for sensing movement of the bed means in said second direction caused by heartbeat and respiration pulses originating from a patient being monitored.

4,884,579

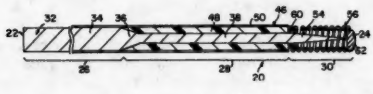
CATHETER GUIDE WIRE

Erik T. Engelson, Palo Alto, Calif., assignor to Target Therapeutics, San Jose, Calif.

Filed Apr. 18, 1988, Ser. No. 182,870

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—772 **15 Claims**



1. A catheter guide wire designed for use in guiding a catheter to a target site along a tortuous vessel path which is at least about 20 cm long and which has sharp-bend vessel junctions, requiring advancing a distal portion of the wire across the junction, then sliding the catheter over the advanced portion of the wire, said guide wire comprising

a flexible, torqueable proximal wire section between about 50–250 cm in length and formed of a proximal wire core segment having an outer diameter of between about 10–40 mils,

a more flexible intermediate section having a length between about 20–60 cm and formed from an intermediate wire-core segment having a reduced diameter of between about 4–20 mils and between about 10%–50% of the core's proximal segment, and a flexible polymer tube covering which encases the intermediate core segment and which provides column strength thereto, and

a most flexible distal end section have a length between about 1–10 cm and formed from a distal wire core segment having a reduced diameter of between about 2–6 mils, and a flexible sleeve covering the distal end segment and providing column strength thereto,

said intermediate section having a polymer surface which makes the section more lubriciuos than the adjacent distal end segment and said wire core.

4,884,580

HYPERTHERMIA DEVICE

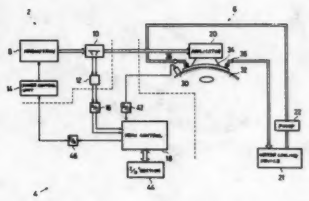
Makoto Kikuchi, Mitaka; Shinsaku Mori; Yoshio Nikawa, both of Tokyo, and Takashige Terakawa, Tokyo, all of Japan, assignors to Tokyo Keiki Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 14,138, Feb. 12, 1987, abandoned, which is a continuation of Ser. No. 707,490, Mar. 1, 1985, abandoned. This application Sep. 30, 1988, Ser. No. 251,973

Claims priority, application Japan, Mar. 4, 1984, 59-40792; Mar. 4, 1984, 59-40793; Mar. 4, 1984, 59-40794; Mar. 4, 1984, 59-40795; Mar. 4, 1984, 59-40796

Int. Cl.[4] A61N *5/02*

U.S. Cl. 128—804 **5 Claims**



1. A hyperthermia device for treating a region of a body comprising:

(a) a selectively operable microwave generator having an adjustable power level for producing microwaves;

(b) an applicator responsive to microwaves produced by the generator for directing the microwaves into said region thereby heating the same;

(c) a temperature sensor for measuring the temperature of the body;

(d) adjustable power level control means for effecting step-wise changes in the power level of the produced microwaves;

(e) means for selecting a set value of temperature of the body;

(f) control means responsive to said temperature sensor for periodically measuring the temperature of the body and for periodically causing said adjustable power level control means to step-wise increase the power level if the measured temperature is less than the set value and to decrease the power level if the measured temperature is greater than the set value;

(g) means for starting the timing of a heating cycle during which the temperature of said region is held at said set value of temperature for a preselected time in response to the first time the measured temperature exceeds the set temperature;

(h) means for operating said generator for a fixed period of time in response to either selection of a set value of temperature or a temperature measurement less than said set value; and

(i) means for terminating the operation of said microwave generator at the end of said heating cycle

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4,884,581

ORAL HYGIENE TONGUE HOLDER

Josephine Rescigno, 918 N. Beverly Dr., Beverly Hills, Calif. 90210

Continuation of Ser. No. 894,086, Aug. 7, 1986, abandoned, which is a continuation of Ser. No. 800,352, Nov. 20, 1985, abandoned, which is a continuation of Ser. No. 708,113, May 5, 1985, abandoned, which is a continuation of Ser. No. 357,198, Mar. 11, 1982, abandoned. This application Jul. 12, 1988, Ser. No. 218,446

Int. Cl.[4] A01F *13/00, 5/56, 5/58*

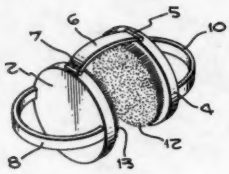
U.S. Cl. 128—869 **17 Claims**

1. A tongue holding aid for improving the grip maintainable

by a user's thumb and finger on a tongue, said tongue holding aid being formed of a flexible material and comprising:

first and second clasping members, each of said clasping members comprising a circular disk having oppositely disposed first and second circular sides,

finger attaching means on the first side of each circular disk for removably attaching said clasping member to one of the thumb and finger of the user, said finger attaching means comprising a loop affixed to each circular disk at diametrically opposite attachment points adjacent the periphery thereof, said loop having a substantially semicircular arcuate shape which forms an opening for receiving one of the thumb and finger of the user;



gripping means on said second side of each circular disk for providing a non-slip grip on a surface of the tongue; and

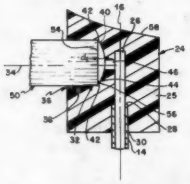
flexible interconnecting means for interconnecting said first and second clasping members in a spaced apart relationship, said flexible interconnecting means being affixed to each circular disc adjacent the periphery thereof at a point angularly spaced from the attachment points of the loop associated therewith, the clasping members, finger attaching means, gripping means and flexible interconnecting means comprising a unitary structure molded in one piece of a flexible elastomeric material.

4,884,582

CIGARETTE MOISTENING APPARATUS AND COMPONENTS THEREOF

George E. Brackett, 9897 Treasure Cay Ln., Bonita Springs, Fla. 33923

Filed Dec. 10, 1986, Ser. No. 940,063
Int. Cl.[4] A24F *47/00*
U.S. Cl. 131—329 **19 Claims**



1. A cigarette moistening apparatus comprising:

(a) a dispenser including a container adapted to be held in the hand, a liquid disposed within said container, said liquid being suitable for moistening a cigarette, said dispenser also having a hollow stem movably mounted to said container and projecting therefrom in a first direction, and means for discharging said fluid through said hollow stem upon movement of said stem relative to said container; and

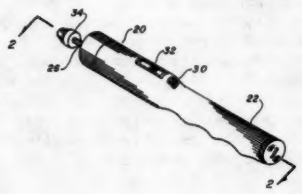
(b) a button mounted on said stem, said button having a cigarette-receiving bore, said bore having a bore axis extending in a bore direction generally transverse to said first direction, said bore having an open end adapted to receive an end of a cigarette so that the cigarette projects lengthwise in said bore direction, said bore communicating with said hollow stem, whereby a cigarette can be moisturized by inserting the same in said bore and engaging said button to thereby move said stem.

4,884,583

HAIR ROLLER AND ROTATING APPARATUS

Oscar C. Long, Jr., 516 Evergreen St. No. 4, Inglewood, Calif. 90302

Filed Jan. 11, 1988, Ser. No. 141,962
Int. Cl.[4] A45D *2/00*
U.S. Cl. 132—238 **9 Claims**



1. A hair roller and power driven self-contained rotating apparatus comprising:

(a) a body in cylindrical shape having a first and second end with said first end forming a handle to be gripped thereupon;

(b) an electric reduction gear drive motor disposed within the second end of the body having a drive shaft extending linearly therefrom providing the rotational force for the apparatus;

(c) means to store electrical energy contained within said handle portion of the body supplying electrical power to the motor providing self-contained torsional force;

(d) a plurality of motor control switches mounted in the body electrically energizing the motor, also regulating int direction and speed;

(e) roller attaching means drivingly mounted onto the end of said motor drive shaft providing a connecting interface thereupon;

(f) a hollow cylindrical roller forming the body of a curler having means to receive on one end and a raised bead inside the hollow portion near the end on the other, also a rib extending axially along from 80 to 90 percent of the rollers length, said roller removably connected onto said roller attaching means, for wrapping ones hair on the periphery thereof during hair-setting procedures in order to produce curls;

(g) a locking peg extending from said roller near said body second end for attachment;

(h) a clip integral with said roller having an extended and an attached end and a slot near the extended end and a narrow portion at the attached end forming a living binge axially juxtapositioned with said roller, further, said clip having a cavity on the side next to said roller formed in such a manner as to tightly interface with said rib on the roller when the slot snappingly engages said locking peg for attaching the ends of ones hair to the roller prior to rolling; and,

(i) a clamp having a hollow sleeve with a stepped shoulder on one end, the shoulder slightly smaller in diameter than said cylindrical roller and said shoulder having a groove therein, also a pair of parallel arms integral with said sleeve terminating into a C-shaped jaw, said sleeve rotatably disposed within the hollow bore of the roller grippingly interfacing the groove with said raised bead in the roller bore retaining the clamp into the roller, allowing the clamp to rotate freely prior to engagement, further the arms engagingly distend on either side of the roller with the jaw gripping the roller holding the arms removably in

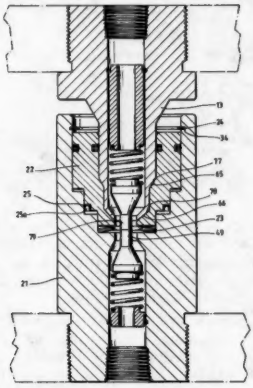
place, thereby holding rolled hair on the outside of the roller when rotation of the roller attached to the rotating apparatus is completed.

4,884,584

INTERNALLY PRELOADED METAL-TO-METAL SEAL HYDRAULIC CONNECTOR

Robert E. Smith, Stafford, Tex., assignor to National Coupling Company, Inc., Stafford, Tex.

Filed Aug. 14, 1987, Ser. No. 85,982
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614.04 **24 Claims**



1. A coupling comprising:
a female member having a longitudinal bore therethrough;
a female seal member having an outer circumference for sliding engagement with the bore of the female;
a metal ring seal for engagement with the outer circumference of the female seal member and with the longitudinal bore of the female member to effectuate a first fluid seal therebetween;
a male member for insertion into the female seal member to form a second fluid seal therebetween; the male member being slidable with respect to the female member while maintaining the second fluid seal with the female seal member; and
an internal preload device to urge the female seal member into contact with the male member, the female seal member adapted to slide longitudinally with respect to the female member during relative axial displacement of the male member and the female member.

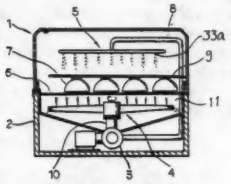
4,884,585

ROTARY SPRAYER FOR AN AUTOMATIC DISHWASHER

Yang H. Oh, 257-6, Naigwang-ri, Bongnam-myon, Kimjei-gun, Chonbuk, Rep. of Korea

Filed Oct. 21, 1988, Ser. No. 260,616
Int. Cl.[4] A47L *15/23*
U.S. Cl. 134—176 **5 Claims**

1. A rotary sprayer for an automatic dishwasher which comprises:
a dishwasher cabinet having a front opening door mounted thereto, said dishwasher cabinet defining an interior washing cavity,
at least one dish rack supported at a middle portion of said interior washing cavity,
a fixed spray member disposed above said dish rack, said fixed spray member including a substantially horizontal, elongated tube containing a plurality of nozzles disposed at the bottom of said horizontal tube for spraying water onto the dishes held by said dish rack,
a motor and pump connected to said horizontal tube for pumping water therethrough, and
a rotary spray member disposed below said dish rack in the lower portion of the washing cavity, said rotary spray member including:
a pair of elongated hollow arms each having a plurality of top nozzles disposed on a top portion thereof,
a pair of end nozzles facing in opposite directions and disposed at a front and a rear side wall of an end portion of said pair of elongated hollow arms, respectively, whereby said top nozzles direct water to said dishes held by said dish rack and the pair of end nozzles function to create a driving force for rotating said rotary sprayer member,



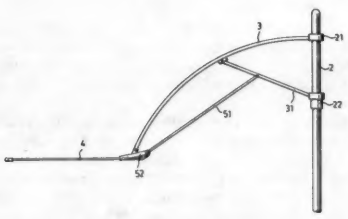
a pair of rotation converting valves for alternately opening and closing said end nozzles, and
a cylindrical housing connected to said pair of elongated hollow arms, said cylindrical housing containing:
an inlet and outlet for introducing and draining water therethrough, respectively, and
valve driving means toggled for driving said pair of rotation converting valves so that the rotary spray member periodically reverses its rotating
direction, whereby the dishes held by the dish rack are uniformly cleaned by spraying the surface of the dishes with said fixed and rotary spray members.

4,884,586

RIB COUPLING FOR HAT-LIKE UMBRELLAS

Tseng Szu, No. 6, Niu-P'u Road, Hsin-Chu City, Taiwan, and Tadashi Shimizu, Harada cho 3-3-31, Toyonaka-shi, Osaka, Japan

Filed Nov. 28, 1988, Ser. No. 276,687
Int. Cl.[4] A45B *11/00*
U.S. Cl. 135—26 **1 Claim**



1. A hat-like umbrella frame comprising a stick, a plurality of main ribs radiating from a crown which is disposed on the stick, said main ribs being interconnected by a plurality of main stetchers with a runner slidable on the stick, a plurality of rib stretchers having one end hinged to at least some of said main stretchers and having another end coupled with a free end of at

least some of said main ribs and a respective visor rib by a respective coupling member;

said visor rib being composed of an outer segment with a smaller diameter than an inner segment thereof, said rib stretcher and said main rib being pivotally connected to said inner segment of said visor rib;

said coupling member being substantially U-shaped with an opening at one end thereof for allowing said visor rib to pass through, another end of said coupling member being hinged to said rib stretcher at a position adjacent to the connection point between said visor rib and said rib stretcher, said outer segment of said visor rib being slidable within said opening of said coupling member, said inner segment of said visor rib being unable to pass through said opening of said coupling member so that a sliding movement between said visor rib and said coupling member will be stopped; and

said visor rib being movable outwardly and downwardly until said inner segment thereof is stopped by said coupling member to become substantially horizontal and said main rib being stopped to move outwardly and upwardly due to the connection between said visor rib and said main rib when opening the umbrella.

4,884,587

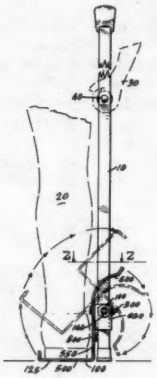
AUXILIARY CANE OR CRUTCH DEVICE FOR HELPING TO LIFT LEGS OR FEET OR FOOT

Edwin M. Mungons, 719 Society Dr., Holiday, Fla. 43691

Filed Oct. 13, 1987, Ser. No. 107,022

Int. Cl.[4] A61H *3/00*

U.S. Cl. 135—65 **4 Claims**



1. An auxiliary device for attachment to a crutch having a vertical shank used to aid a person to ambulate with said auxiliary device adapted to assist the crutch user to raise the lower part of the leg which is adjacent to the crutch; said device comprising:

(a) a rigid support frame member comprises of a base cross brace member, said base cross member having parallel arms extending in a perpendicular manner from the respective ends of the base cross brace member, having an inner and outer face, and which parallel arms are adapted to fixedly embrace the vertical shank of the crutch;

(b) secondary support means affixed in a perpendicular manner to the outer face of the cross brace member, said secondary support means, projecting in a direction opposite to that of parallel arms;

(c) a foot assist member pivotally mounted on said secondary support bolt means on said support frame, said foot assist member adapted to pivotably rotate on said frame member;

(d) circulate control plate means connected to said foot assist member and mounted on said secondary support means having a circumferential periphery with said periphery having a plurality of indentations therein, said control plate means being adapted to control the pivotal movement of said foot assist member.

4,884,588

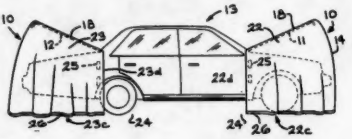
VEHICLE HOOD SUPPORTED FRAMELESS FOLDABLE PROTECTIVE EMERGENCY SHELTER

John Shrode, 3006 Stabler, Lansing, Mich. 48910

Filed Sep. 26, 1988, Ser. No. 248,584

Int. Cl.[4] E04H *15/06*

U.S. Cl. 135—88 **1 Claim**



1. In a unitary frameless foldable protective emergency shelter for selective drapeable deployment over a raised engine hood during an emergency so as to protect the engine compartment work area and person working therearound from inclement weather, the combination comprising:

a front panel portion, said front panel portion provided with a vertical slit opening, said slit opening provided with closure means to effect selective closure of said opening;

an engine hood-engaging rearwardly and downwardly sloped top portion having a reat horizontal edge coextensive with the rear edge of the raised engine hood, said top portion adapted for coextensive draped engagement with the upper surface of a raised engine hood;

a pair of spaced-apart side portions having vertical rear edges, said pair of spaced apart side portions cooperating with said front panel portion and said top portion to form a tent-like protective shelter over the engine compartment of the vehicle, said side portions and said front panel portion having ground engaging edges extending into contact with the ground surface;

a plurality of weighted elements provided along said ground engaging edges of said side portions and said front panel portion so as to maintain said ground engaging edges in relatively secure contact with the ground surface; and

a plurality of vehicle body engaging magnetic elements provided along said vertical rear edges so as to maintain said vertical rear edge in vehicle body engaging contact.

4,884,589

COVER FOR COLLAPSIBLE SHELTER

David H. Simpson, Concord, Canada, assignor to Klein Tools Inc., Chicago, Ill.

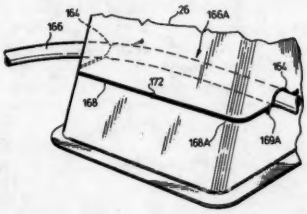
Continuation-in-part of Ser. No. 906,085, Sep. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 685,555, Dec. 24, 1984, Pat. No. 4,612,948. This application Sep. 29, 1988, Ser. No. 250,741

Int. Cl.[4] E04H *15/58, 15/64;* **E04B** *1/12*

U.S. Cl. 135—117 **6 Claims**

1. For a portable self-supporting collapsible shelter having a supporting frame, a cover comprising when erected upon said frame a tent enclosure having at least two side walls, a top wall, and a front wall; the cover having at least one continuous opening slit directed across at least two adjacent walls, the at least one continuous opening slit when open providing a mouth having an upper lip and a lower lip which are separable and which extend to two remotely spaced edges of the mouth, the at least one continuous opening slit being closed and opened by

closure means, the said mouth when open suitable to receive at least one section of a cable longitudinally passing through the tent enclosure, said at least one section of cable receivable into the said tent enclosure through the mouth to the extent of the two remotely spaced edges of the mouth, the closure means in use for joining the upper lip and the lower lip to proximate the two remotely spaced edges of the mouth sufficient to form two



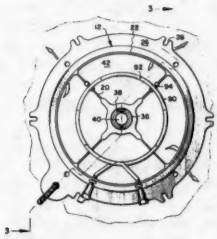
apertures, one aperture proximate each edge of the mouth; whereby in use the mouth is substantially closed by the closure means so as to enclose the at least one section of cable in the tent enclosure and form two apertures about the section of cable, one aperture proximate each edge of the mouth; and whereby the mouth may be opened to permit removal of the at least one section of cable from the tent enclosure.

4,884,590

ELECTRIC MOTOR DRIVEN AIR VALVE

David H. Eber, La Crosse, Wis., and H. Kenneth Ring, Houston, Minn., assignors to American Standard Inc., New York, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,638
Int. Cl.[4] F16K *31/04*
U.S. Cl. 137—1 **15 Claims**



1. An air valve comprising:

a generally cylindrical inlet section, said inlet section having a seating surface;

support means downstream of and fixedly mounted with respect to said inlet section;

a damper assembly, said damper assembly being restrained from rotation and being supported upstream of said seating surface by said inlet section and downstream of said seating surface by said support means;

means for driving said damper assembly into abutment with said inlet section seating surface, the abutment of said damper assembly with said seating surface causing strain to develop in said valve; and

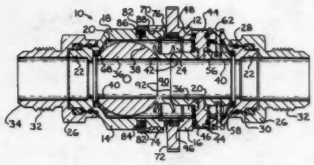
means for sensing the development of strain in said valve subsequent to the driving of said damper assembly into abutment with said inlet section seating surface, said means for sensing being operatively connected to said means for driving so that said means for driving is de-energized when the strain resulting from the abutment of said damper assembly with said inlet section seating surface reaches a predetermined level.

4,884,591

RECONNECTABLE FRANGIBLE BALL VALVE COUPLING

Alexander P. Webster, Concord, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Sep. 1, 1988, Ser. No. 239,408
Int. Cl.[4] F16L *29/00*
U.S. Cl. 137—68.1 **10 Claims**



1. A reconnectable, frangible, valved coupling comprising, in combination, first and second coupling parts each having an axial passage extending therethrough, each part having a conduit attachment end and an open end communicating with the associated passage, a self-closing valve located in each part passage intermediate the associated parts' ends having an open position and a closed position sealing the associated passage, spring means biasing each valve toward its' closed position, readily connectible and releasable interlocking means defined on each part adjacent said open end thereof, said interlocking means of said first part being releasably interlocked with said interlocking means of said second part upon said parts' open ends being aligned in opposed relationship, valve retaining means interposed between said parts' valves when said parts are interlocked retaining said valves in their open positions, and frangible portions defined in at least one of said parts' interlocking means permitting said one interlocking means to fracture upon impact and said parts to separate and permitting said valves to be biased to their closed portions.

4,884,592

REEL-LESS DISPENSE CONSOLE

Richard H. Peterson, Minnetonka, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Mar. 10, 1989, Ser. No. 321,649
Int. Cl.[4] B60S *5/02*
U.S. Cl. 137—234.6 **4 Claims**

1. A dispense console in combination with a garage having a floor having top and bottom surfaces, a basement beneath said floor and a plurality of parallel stalls on said floor, said console comprising:

an elongated housing located on said top surface of said floor and between and parallel to two of said stalls, said housing having a front, a back, a top and a bottom;

a first set of guide means located in said housing top;

an aperture in said floor generally coextensive with said housing bottom;

a second set of guide means attached to said floor; and

a plurality of flexible hoses, each said hose having a first end attached to a pressurized fluid source in said basement and a second end having a dispensing element, the length of

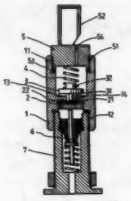
each said hose between said ends being sufficient to form a downward loop from said bottom surface at said floor and thence pass upwardly through said second set of guide means and aperture to said housing top.

4,884,593

VALVE FOR CHECKING TIRE PRESSURE

Kwang-Ho Chen, No. 407, Chunghsiao E. Road, Section 6, Taipei, Taiwan

Filed Oct. 27, 1988, Ser. No. 263,623
Int. Cl.[4] F16K *37/00, 15/20*
U.S. Cl. 137—557 1 Claim



1. A valve for checking tire pressure, comprising:

a hollow cylinder having a flange inwardly extending to form an opening, and dividing the hollow cylinder into an upper and lower portion, a first screw threaded bushing coacting with internal walls arranged at said upper portion, and a second screw threaded bushing coacting with internal walls arranged at said lower portion, for receiving a flute and valve stem, respectively;

a sealing block disposed in said lower portion of said hollow cylinder, and having a lower surface which directly abuts the valve stem, said stem controlling a fluid pressure source from a tire, providing contact with said flange, said sealing block having a seal disposed on its upper surface thereof and a passage communicating both sides of said sealing block;

a plate disposed in said upper portion having a pin extending perpendicularly downward into said opening and a seat formed on an upper surface of said plate;

a spring mounted on said seat of said plate, and

a flute mounted on upper portion of said hollow cylinder including a base and a flute body disposed on said base, said base having outer screws to engage with said first screw threaded bushing of said hollow cylinder and a passage communicating said upper portion of said hollow cylinder and said flute body.

4,884,594

COMPACT TWIN PISTON PUMP

Richard G. Powers, Prairie Village, Kans.; Joseph G. Currier, Lees Summit, Mo., and Joseph S. Zeets, Olathe, Kans., assignors to Marlen Research Corporation, Overland Park, Kans.

Division of Ser. No. 207,889, Jun. 16, 1988, which is a continuation-in-part of Ser. No. 106,563, Oct. 6, 1987, abandoned. This application Feb. 9, 1989, Ser. No. 308,208
Int. Cl.[4] F04B *7/00;* F16K *3/02*
U.S. Cl. 137—625.48 3 Claims

2. Valve means adapted for coupling to a source of pressurized, flowable material which delivers said material from a pair of spaced outlet openings, said valve means comprising:

a rear plate adjacent said outlet openings and having a pair of apertures therethrough in registry with said outlet openings;

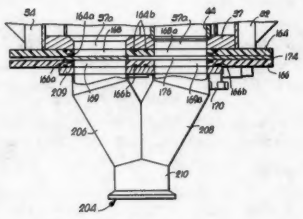
a front plate in face-to-face relationship with said rear plate and having a pair of holes therethrough in alignment with said apertures;

means operatively connecting said front and rear plates together,

there being a channel defined between said front and rear plates;

a valving plate assembly situated within said channel, presenting an opening therethrough having an open area greater than either of said apertures or holes, and slidable between a first extreme position completely blocking one of said apertures with said opening out of communication with said one aperture while permitting free flow through the other of said apertures and through said opening, and a second extreme position completely blocking said other aperture with said opening out of communication with said other aperture, while permitting free flow through said one aperture and said opening,

said opening being oriented on said valving plate for, at an intermediate position thereof between said extreme positions, permitting simultaneous partial flow of material from both of said apertures, through said opening,



there being a pair of inner seals respectively disposed adjacent opposite faces of said valving plate assembly and each of said seals being of a size to circumscribe said pair of apertures and said pair of holes and said opening, said valving plate assembly being of a size to maintain constant contact with the entirety of each of said inner seals in all operational positions of said valving plate assembly, whereby to maintain the sealed integrity of the valve means; and

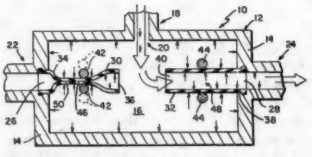
two pairs of outer seals, one pair thereof being disposed adjacent the face of said front plate remote from said valving plate and respectively in circumscribing relationship with said front plate holes, the other pair of outer seals being disposed adjacent the face of said rear plate remote from said valving plate and respectively in circumscribing relationship with said rear plate apertures.

4,884,595

FLOW CONTROL DEVICE

Lee A. Grove, Elkhart, Ind., assignor to Remote Controls, Inc., Mishawaka, Ind.

Filed Apr. 21, 1989, Ser. No. 341,474
Int. Cl.[4] F16K *11/18;* F16L *55/14*
U.S. Cl. 137—636.1 22 Claims



1. A flow control device, comprising:

a body having sidewalls which define a fluid-holding chamber;

inlet means opening into the chamber for supplying a fluid flow into the chamber under a positive pressure;

outlet means opening into the chamber and including an outlet opening in the body;

collapsible tubing means having one end sealingly attached to the outlet opening and having a free and open opposite end extending into the chamber; and

means for selectively collapsing and uncollapsing said tubing means at a first point to block and unblock the flow of fluid from the chamber through the outlet means, wherein a decrease in the downstream pressure of fluid in the tubing means causes the fluid pressure within the chamber to positively compress the tubing means downstream of said first point adjacent said one end.

4,884,596

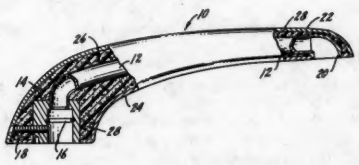
PLUMBING FIXTURE WITH INTERIOR INSULATING AND ADHESIVE FOAM

Hugo Byers, Amherst, and Tracy H. Lang, Cleveland, both of Ohio, assignors to Stanadyne, Inc., Windsor, Conn.

Filed Dec. 9, 1988, Ser. No. 281,638

Int. Cl.[4] E03C *1/02*

U.S. Cl. 137—801 **4 Claims**



1. A spout including a tubular waterway and an enclosing cover which consists of an outer shell and a throat cover, a space between said enclosing cover and said waterway, said space being filled with a foam which secures the waterway to and between both the outer shell and throat cover and secures the outer shell, throat cover and waterway into a single integral unit and provides temperature, noise and vibration insulation between the waterway and cover.

4,884,597

PILE WARP YARN TENSION CONTROL

Zenji Tamura, Kanazawa; Kenji Sakurada, Matsuto, and Akihiko Nakada, Komatsu, all of Japan, assignors to Tsudakoma Corp., Ishikawa, Japan

Filed May 6, 1988, Ser. No. 191,265

Claims priority, application Japan, May 8, 1987, 62-111976; Aug. 21, 1987, 62-209063

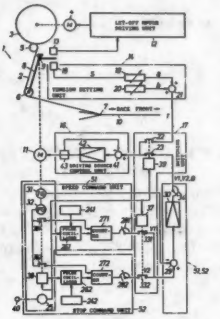
Int. Cl.[4] D03D *49/10*

U.S. Cl. 139—102 **14 Claims**

1. A pile warp yarn tension control method for a weaving operation using a tension control mechanism which has a tension roller supported for movement about a center of swing motion, the tension roller having pile warp yarns extended therearound around and the tension of the pile warp yarns extended around the tension roller changing in response to a change in the position of the tension roller, comprising:

(a) a position control step in which the tension roller is shifted forcibly in a displacement direction to a predetermined position at a desired speed in order to reduce the tension of the pile warp yarns in a time period when the tension of the pile warp yarns varies rapidly;

(b) a torque control step in which a desired torque about the center of swing motion is applied to the tension roller in order to maintain the tension of the pile warp yarns at a desired value corresponding to said desired torque; and



(c) a stop position control step in which the tension roller is held stopped at a predetermined position during a predetermined period of the weaving operation.

4,884,598

SYSTEM FOR INSTANTANEOUSLY DETECTING BREAKAGE OF A WEFT YARN IN A MULTIPHASE LOOM SHED

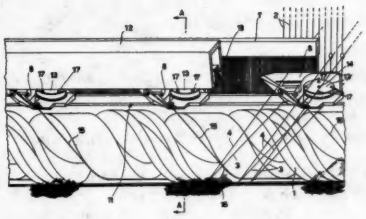
Luciano Corain; Gianni Maitan, both of Vicenza, and Enrico Valsecchi, Valdagno, all of Italy, assignors to NUOVOPIGNONE-Industrie Meccaniche e Fonderia, S.p.A., Italy

Filed Aug. 30, 1988, Ser. No. 238,255

Claims priority, application Italy, Nov. 20, 1987, 22710 A/87

Int. Cl.[4] D03D *51/34*

U.S. Cl. 139—371 **3 Claims**



1. A system for detecting breakage of a weft yarn in a multiphase loom having at least one shed, a weaving zone, and a plurality of successively disposed shuttles, each said shuttle being able to move across said weaving zone and having a rotatably-mounted yarn package, which yarn package dispenses a weft yarn into said shed, wherein the improvement comprises:

at least one off-center magnetic element mounted on said yarn package so that as said yarn package rotates said magnetic element describes a circular path;

a plurality of closed-loop induction coils extending along said weaving zone, each said induction coil being disposed so that a fluctuating electric current is induced in said coil as said yarn package simultaneously rotates and moves across said weaving zone, and a less intense current which smoothly increases and then decreases is induced when said yarn package moves across said weaving zone without said yarn package rotating;

means for electrically sensing when said yarn package has ceased rotating; and

means for halting said loom, said means for sensing triggering said means for halting and stopping said loom when said yarn package passes along said weaving zone without said yarn package rotating.

4,884,599

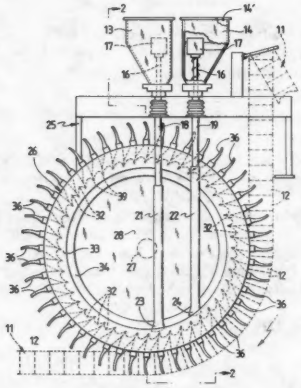
APPARATUS FOR PACKAGING FLUID MATERIALS INTO PACKETS

Robert M. Newman, Decatur, and Kenneth R. Warmath, Madison, both of Ala., assignors to Ropak Manufacturing Company, Inc., Decatur, Ala.

Filed Mar. 16, 1988, Ser. No. 168,930

Int. Cl.[4] B65B *43/42*; B67C *3/00*

U.S. Cl. 141—1 **14 Claims**



1. Apparatus dispensing fluids in uniform units for packaging into separate containers comprising:

(a) means defining a plurality of aligned discharge regions for discharging said fluids therethrough at a preselected rate;

(b) a plurality of uniformly and annularly spaced funnel elements, each funnel element having a larger end having an area larger than said discharge region and a smaller end mounted for sequential rotation about a central axis with said larger ends facing radially inwardly such that each funnel elements passes sequentially beneath said discharging means through said aligned discharge regions during said rotation;

(c) means for rotating said plurality of funnel elements at a predetermined angular speed such that each funnel element receives a predetermined quantity of said fluids as it passes through said discharge region;

(d) a plurality of discharge elements communicating with said plurality of funnel elements with each discharge element extending generally radially outwardly from said smaller end of said funnel elements;

(e) means for guiding a series of said separate containers into engagement with said discharge elements proximal said discharge region whereby said predetermined quantity of said fluid is discharged into each of said separate containers, with each of said separate containers having an open end adapted to receive discharge elements therewith during said engagement therewith.

4,884,600

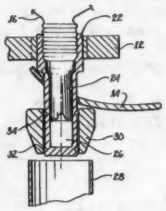
OIL NOZZLE APPARATUS AND METHOD

Ronald J. Wilson, 2239 E. Clarendon, Phoenix, Ariz. 85016

Continuation of Ser. No. 90,949, Aug. 28, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 273,841

Int. Cl.[4] B65B *39/00*; B65C *11/00*

U.S. Cl. 141—1 **18 Claims**



10. A method of dispensing oil from an oil container through an improved oil nozzle apparatus comprising the steps of:

providing receiving end means for detachably coupling said oil nozzle apparatus with said oil container;

providing tubular member means operably coupled with said receiving end means for accommodating a flow of said oil;

providing outlet means at a lower end of said tubular member means for dispensing said oil into an oil receiving port;

providing ring member means slidably coupled with said hollow tubular member means for controlling said flow of oil through said outlet means;

providing shut-off handle means operably coupled with said oil nozzle apparatus for sliding said ring member means to seal said outlet means in a closed position;

coupling said oil nozzle apparatus with said oil container;

inverting said oil container;

exerting downward pressure on said oil container to slide said ring member means into a position to allow said flow of oil into an engine; and thereafter

exerting downward pressure on said shut-off handle means to stop said flow of oil.

4,884,601

APPARATUS FOR LOADING COSMETIC MATERIAL INTO A CONTAINER AND SOLIDIFYING SAID COSMETIC MATERIAL

Yoshiharu Hatakeyama, and Mitsuo Ishiguro, both of Tokyo, Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 13,423, Feb. 11, 1987, Pat. No. 4,817,686. This application Sep. 2, 1988, Ser. No. 239,745

Claims priority, application Japan, Feb. 17, 1986, 61-30688; Feb. 17, 1986, 61-30689

Int. Cl.[4] B29J *5/00*

U.S. Cl. 141—71 **13 Claims**

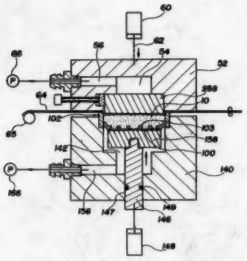
1. An apparatus in combination with a container for loading therein a cosmetic material having a solvent and solidifying said cosmetic material, said container having an upper open end and comprising a frame forming a side wall and having an upper edge and a bottom plate slidably fitted in said frame, and said apparatus comprising:

means for preparing a viscous cosmetic material and for dripping a predetermined amount of aid cosmetic material into said container;

a supporting block having a recess formed therein to hold said container in position;

a presser having a flat and smooth lower surface of a dimension larger than a dimension of said frame of said container for closing said upper open end thereof, said lower surface, upon closing said upper open end, being positioned at the level of said upper edge of said frame;

drive means in said supporting block for pressing said bottom plate of said container upwardly relative to said frame, whereby the upward movement of said bottom plate compresses said cosmetic material between said bottom plate and said lower surface of said presser such that the upper end of said cosmetic material is formed flat and flush with said upper edge of said frame;



at least one of said supporting block and said pressure having formed therein a hollow space, vacuum means connected to said hollow space for maintaining sub-atmospheric pressure in said hollow space; and

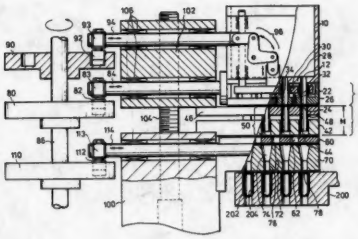
a porous absorbent element secured in said hollow space at a position adjacent said container such that the solvent from the cosmetic material is absorbed into said porous absorbent element upon compression of said cosmetic material.

4,884,602

APPARATUS FOR FILLING GRANULAR SUBSTANCE INTO HARD GELATIN CAPSULES

Taizo Yamamoto, Osaka, and Hirokazu Konishi, Sakurai, both of Japan, assignors to Nippon Elanco Kabushiki Kaisha, Osaka, Japan

Filed Jun. 17, 1988, Ser. No. 208,075
Claims priority, application Japan, Jun. 18, 1987, 62-153034
Int. Cl.[4] B65B *3/10*
U.S. Cl. 141—242 **3 Claims**



1. In capsule filling apparatus wherein in a filling operation a predetermined quantity of granular material is portioned by volume in a metering chamber and then gravitated down into hard gelatin capsule bodies positioned to under the chamber, the improvements comprising:

a metering chamber assembly including a metering table having a through hole therein for gravitational flow of material therethrough into a capsule body, shutter means for closing and opening the lower end of said hole, and a tubular body in telescoping engagement with said hole from the upper end of said hole;

a horizontally-reciprocable hopper having a bottom outlet moving into and out of alignment with the upper end of said tubular body to open and close said tubular body;

a supporting column, a bearing block supported thereon and a threaded connection therebetween for adjusting the height of said block;

means carrying said hopper and said tubular body on said block for adjusting the extent of said telescoping engagement to adjust the capacity of said metering chamber assembly and accordingly said predetermined quantity;

push rod means carried by said hopper movable into and out of alignment with the upper end of said tubular body, said push rod means being vertically reciprocable and movable into said upper end of said tubular body when said hopper outlet is out of alignment therewith to disintegrate any bridging of the material during a filling operation and out of said upper end during a portioning; and

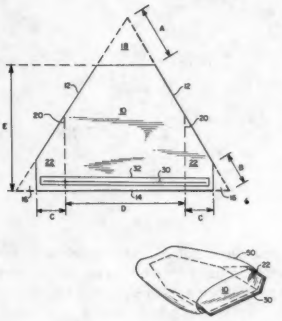
cam means for horizontally reciprocating said hopper and said push rod means and for vertically reciprocating said push rod means in synchronism with the horizontal reciprocation of said hopper for a portioning and filling operation.

4,884,603

DEVICE FOR HOLDING THE MOUTH OF A FLEXIBLE BAG OPEN AND METHOD OF USE

Ted Simpson, 231 Banbury Rd., Columbia, S.C. 29210

Filed May 9, 1989, Ser. No. 349,178
Int. Cl.[4] B65B *39/02, 67/00*
U.S. Cl. 141—390 **15 Claims**



1. A device for holding a flexible bag in an open position for filling, comprising:

(a) a deformably rigid planar insert capable of being folded and inserted into a flexible bag, said insert generally having the shape, when flat, of an isosceles triangle with three truncated corners, the first two corners at the distal ends of the base side of said triangular insert being truncated generally perpendicular to said base side, and the third corner opposite said base side being truncated generally parallel to said base side,

said triangular insert having on a first face thereof two linear spaced apart crease lines generally perpendicular to said base side extending across said first face for forming panels between said crease lines and said first two corners and for facilitating the folding together of said panels to form a U-shape,

wherein the distance between said two crease lines is approximately equal to the perpendicular distance between said base side and said truncated third corner; and

(b) a generally linear, bendably rigid, reinforcing member affixed to the second face of said insert opposite said first face extending beyond said crease lines, said member being adjacent and generally parallel to said base side for

selectively maintaining said insert in a flattened or a folded form,

said member being resilient for creating a springlike action in said panels when said insert is folded along said crease lines,

whereby said insert, when folded along said crease lines into a generally U-shape, may be positioned inside a flexible bag, said third corner first, with said springlike action of said panels resiliently exerting pressure upon the bag to hold the bag open for filling, and

whereby said insert, when folded along said crease lines, is able to stand upright on said base side supported by said panels to facilitate the placement of a flexible bag over said third corner and onto said insert, and

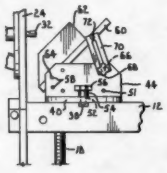
whereby said insert, when folded and positioned inside a flexible bag, holds a portion of the opening of the bag flat for filling and simultaneously allows another portion of the opening of the bag to be resiliently deformed for filling oversized and/or irregularly shaped articles.

4,884,604

GUIDE FENCE AND MITRE GUIDE ASSEMBLY FOR ROUTER MOUNTING TABLE

Verle L. Rice, Harrisonville, Mo. 64701, and Richard A. Keener, Garden City, Mo., assignors to Verle L. Rice, Harrisonville, Mo.

Filed May 6, 1988, Ser. No. 190,894
Int. Cl.[4] B27F *5/00*
U.S. Cl. 144—84 **4 Claims**



1. A variable angle mitre gauge for use with a power woodworking tool mounted on a table having a stationary horizontal surface with a groove extending along said surface in a direction parallel to the direction of travel of a wood piece being worked, said mitre gauge comprising:

an elongated member adapted to be received in and slide along said groove;

a support plate coupled with said member and presenting a guide surface extending perpendicular to said stationary surface and perpendicular to the plane occupied by said tool;

means for presenting a planar work piece supporting surface;

means for pivotally coupling said surface presenting mean with said support plate; and

means for holding said surface presenting means in a fixed position relative to said support plate.

4,884,605

LATHE CHARGER CENTERING WITH LOG SCANNING DURING ROTATION AND LATERAL MOVEMENT OF SPINDLES

Gary W. Ely, Canby, Oreg., assignor to The Coe Manufacturing Company, Painesville, Ohio

Filed Feb. 3, 1989, Ser. No. 306,473
Int. Cl.[4] B27B *1/00*
U.S. Cl. 144—357 **20 Claims**

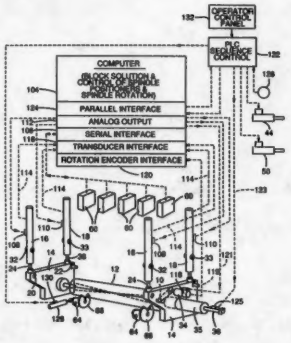
1. A method of centering a log in a veneer lathe charger, comprising the steps:

positioning a log in the lathe charger;

rough centering the log on the approximate center axis of said log;

engaging the opposite ends of the log with spindles at the approximate center axis;

rotating the log with said spindles while moving the log laterally toward a transfer position;



scanning the log as it is being rotated and moved toward the transfer position to produce electrical scan data corresponding to the surface configuration of said log;

determining the optimum yield axis of the log from said scan data; and

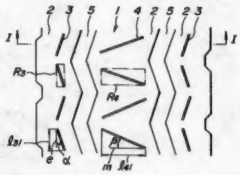
adjustment of the spindles to align the optimum yield axis of the log relative to the transfer position for transfer to the veneer lathe axis.

4,884,606

PNEUMATIC TIRES HAVING IMPROVED WET PERFORMANCES

Hideki Matsuda, Tokyo, and Hidenori Takahashi, Sayama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 728,536, Apr. 29, 1985, abandoned.
This application Jan. 7, 1987, Ser. No. 4,309
Claims priority, application Japan, May 2, 1984, 59-87799
Int. Cl.[4] B60C *11/12*
U.S. Cl. 152—209 R **4 Claims**



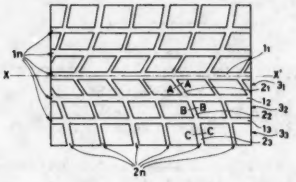
1. A pneumatic tire with improved wet performance comprising a new tire as molded having; a tread of a rib type pattern divided into at least three ribs by at least two circumferential grooves so that said tread defines both side regions and the remaining central region by a pair of said circumferential grooves arranged close to both side ends of said tread, said tread being provided at each region with blind sipes, and each of said sipes arranged on said both side regions and being alternately inclined in opposite directions at a small angle with respect to the circumferential line of the tire and each of said sipes arranged on said remaining central region and being alternately inclined in opposite directions at a small angle with respect to the transverse line of the tire.

4,884,607

PNEUMATIC TIRE TREAD PATTERN WITH LATERAL GROOVES HAVING INCREASING GROOVE ANGLE TOWARDS SHOULDERS

Shinichi Mori, Hiratsuka, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1988, Ser. No. 200,875
Claims priority, application Japan, Jun. 3, 1987, 62-138182
Int. Cl.[4] B60C *11/04*
U.S. Cl. 152—209 R 4 Claims



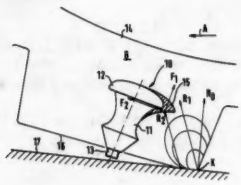
1. A pneumatic tire provided, on the tread surface thereof, with a plurality of main grooves extending along the circumferential direction of the tire, a plurality of ribs defined by said main grooves, and a plurality of subgrooves provided on said ribs and traverse to the circumferential direction of the tire such that adjacent main grooves communicate with each other, each said subgroove having a groove angle defined as an angle of intersection between extended tangent lines to the opposite side walls of said subgroove, wherein the groove angle of said subgrooves provided on said ribs on the shoulder side of the tire is smaller than that of said subgrooves provided on the ribs on the center side of the tire and the cross-sectional area of said subgrooves provided on said ribs is increased in going from the tread center side towards the shoulders while maintaining the width and depth of the subgrooves substantially constant.

4,884,608

SPIKE FITTED ON A VEHICLE TIRE FOR PERPENDICULAR CONTACT WITH THE ROAD

Unto Lindén, Hämeelinna, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI87/00123, § 371 Date Apr. 15, 1988, § 102(e) Date Apr. 15, 1988, PCT Pub. No. WO88/01945, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 18, 1987, Ser. No. 187,536
Claims priority, application Finland, Sep. 19, 1986, 863801
Int. Cl.[4] B60C *11/14*
U.S. Cl. 152—210 9 Claims



1. A spike fitted on a vehicle tire comprising a hole for said spike substantially perpendicular to a wear surface,

said spike comprising an asymmetric region positioned thereon to cause a static stress region in surrounding rubber of said tire which, when a stress wave caused by compression of said tire rubber meets said asymmetric static stress region, generates a force component (F_2) during tire rotation upon driving which acts to turn said spike to a position substantially perpendicular to a surface on which the tire is being driven,

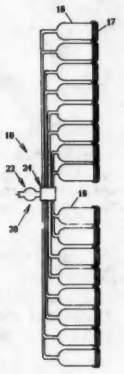
whereby said spike is oriented prior to initial contact with the surface, to meet the surface at said initial contact in said substantially perpendicular position.

4,884,609

NO-FLAT TIRE INSERT

I-Chung Ho, 6958 Grovespring Dr., Rancho Palos Verdes, Calif. 90274

Filed Oct. 2, 1987, Ser. No. 104,332
Int. Cl.[4] B60C *5/06*
U.S. Cl. 152—337.1 15 Claims



1. A no-flat tire insert comprising:

a plurality of balloons, each of said plurality of balloons occupying only a portion of the insert circumference;

a single valve means for simultaneously charging or discharging said plurality of balloons, said valve means opened by a spring-loaded pin and including a valve stem means, defining a central valve stem bore therethrough and a distribution manifold, within said valve stem means, defining a manifold chamber flow connected to said valve stem bore and a manifold distribution surface within said manifold chamber having a plurality of openings therein, each of said openings flow connected to one of said plurality of balloons; and

internal manifold valve means for opening and closing said plurality of openings on said distribution surface and said central valve stem including

a first and a second generally circular plate;

a connector located therebetween, thereby connecting said plates in generally parallel relationship a desired distance apart; and

a spring means for biasing said first plate into contact with said distribution manifold.

4,884,610

DEPRESSED RADIAL TIRE

Kenji Saito, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Jul. 5, 1988, Ser. No. 215,385
Claims priority, application Japan, Jul. 6, 1987, 62-168346
Int. Cl.[4] B60C *3/04*
U.S. Cl. 152—454 6 Claims

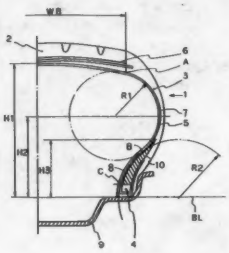
1. A radial tire having an aspect ratio of 65% or less, comprising:

a pair of bead cores disposed in bead portions of the tire;

a carcass having at least one ply of cords turned up at its ends around bead cores, and defining a carcass line; and;

a belt on the carcass, having at least two plies of metallic cords, and defining a belt width, characterized in that

the carcass line ranging from a point under the edge of the belt to a point adjacent the upper end of the bead core comprises only two arcs of an upper arc having a center of



curvature located inside the tire and a lower arc having a center of curvature located outside the tire; and

the radius of curvature of the upper arc divided by the radius of curvature of the lower arc is less than 0.8.

4,884,611

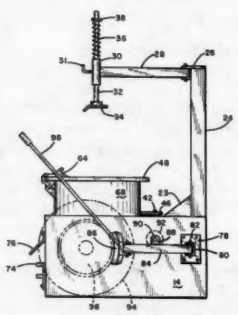
TIRE CHANGING MACHINE

Raymond H. Schmidt, R.R. 1, Box 238A, Buffalo, Minn. 55313

Filed Oct. 24, 1988, Ser. No. 261,636

Int. Cl.[4] B60C *25/07*

U.S. Cl. 157—1.24 **6 Claims**



1. A machine for use in facilitating the removal and replacement of an inflatable vehicle tire on a wheel rim, comprising:

(a) a base cabinet containing a vertically disposed linear actuator having a cylindrical piston extendable and retractable between first and second elevations;

(b) a turntable journaled for rotation atop said base cabinet about said cylindrical piston as an axis;

(c) means for rotating said turntable alternatively in a clockwise or a counterclockwise direction about said axis;

(d) a wheel support table attached in parallel, vertically spaced-apart, superposed relation to said turntable, said wheel support table having a plurality of radially movable wheel rim clamping jaws slidably joined thereto;

(e) means coupling said piston of said vertically disposed linear actuator to said plurality of movable clamping jaws for sliding said jaws from one radial position to another on said wheel support table when said piston of said vertically disposed linear actuator is extended and retracted between said first and second elevations for releasibly securing a vehicle wheel to said wheel table;

(f) a horizontally disposed linear actuator affixed to and contained within said base cabinet and having a reciprocally movable piston rod extending through a side wall of said base cabinet;

(g) a lever arm pivotally secured at one end thereof to the outer surface of said side wall of said base cabinet and a shoe plate affixed to the other end thereof, said piston rod of said horizontally disposed linear actuator being coupled to said lever arm at a point intermediate said one and said other ends; and

(h) means for initially aligning said shoe plate in the bead area of said inflatable vehicle tire prior to actuation of said horizontally disposed linear actuator, whereby upon actuation of said horizontally disposed linear actuator, movement of said lever arm breaks the seal between said bead and said wheel rim.

4,884,612

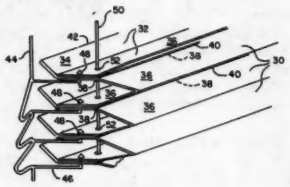
PLEATED BLIND WITH ARTICULATIVE SLAT EXTENSIONS

John Schnebly, Albany, and Thomas J. Marusak, Loudonville, both of N.Y., assignors to Comfortex Corporation, Cohoes, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,090

Int. Cl.[4] A47H *5/00*

U.S. Cl. 160—84.1 **9 Claims**



1. An extended variably light-filtering insulative curtain comprising a continuous pleated fabric adjustable between an extended light-filtering position and a collapsed position, said pleated fabric defining an array of pleats having front-facing crests and rear-facing troughs when in said extended position, said troughs being joined at common lateral edges; a multiplicity of parallel slats arrayed behind and attached to said pleated fabric, a front edge of each slat hingably connected to and along the common lateral edge of a respective trough of each of said pleats; and actuation means to urge a rear edge of each of said slats toward and into contact with an adjacent slat forming therebetween said contacting slats and their common lateral trough edges an insulative sleeve, whereby an array of said insulative sleeves is acquired through their lateral attachment afforded by the continuity of said pleated fabric.

4,884,613

SASH ASSEMBLY WITH BUILT-IN BLIND

Akihiro Komori, Takamatsu, and Muneyoshi Hirano, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 231,345

Claims priority, application Japan, Aug. 12, 1987, 62-124063

Int. Cl.[4] E06B *3/32*

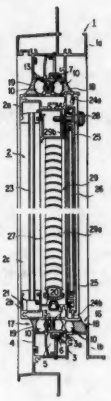
U.S. Cl. 160—107 **5 Claims**

1. A sash assembly with a built-in blind, comprising:

a sacrifice frame fitted in a glass panel fitting groove formed in the inner periphery of the window frame of the existing fixed sash window and having a rail-shaped projecting member formed in the inner peripheral surface thereof;

a window unit having a blind located in between two glass panels mounted, respectively, on the indoor side and outdoor side and also comprising rectangular peripheral stile and rail members each having projecting members formed in the outer peripheral surface thereof, said projecting members being adapted to be connected with the projecting member of said sacrifice panel, said projecting

member formed in the outer peripheral surface of each of the peripheral stile and rail members in the window unit comprising a pair of projecting members formed in parallel relationship and close to each other, a connecting piece being inserted between the pair of projecting members of



each of the stile and rail members at the two ends thereof; and

sealing materials filled in the joints formed between the existing fixed sash window frame and the peripheral stile and rail members of said window unit and located on the indoor side and outdoor side, respectively.

4,884,614

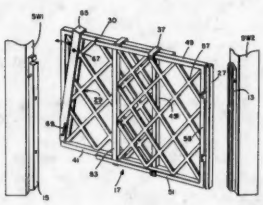
SAFETY GATE

Charles A. Spurling, 7 Indian Path, North Grafton, Mass. 01536

Continuation of Ser. No. 819,069, Jan. 15, 1986, abandoned. This application Aug. 27, 1987, Ser. No. 93,066

Int. Cl.[4] E06B *11/02*

U.S. Cl. 160—225 **1 Claim**



1. A safety gate adapted to be removably and pivotally mounted on one of the sidewalls at the top or bottom of a stairway or one of the sidewalls of a door frame or other similar structure and selectively locked to an opposite sidewall to prevent unwanted passage therethrough, said safety gate comprising:

a. a mounting rail,

b. means for fixedly attaching said mounting rail to one of the sidewalls,

c. a locking post,

d. means for fixedly attaching said locking post to the other sidewall, opposite to the mounting rail,

e. a gate frame, said gate frame having a generally rectangular shape and including a top, a bottom and a pair of sides,

f. a mounting bar hingedly attached to one side of said gate frame and slidably and removably mounted on said mounting rail such that said gate frame can be pivoted back and forth relative to said mounting rail like a swinging door when said mounting bar is mounted on said mounting rail and, when desired can be removed from said mounting rail, and

g. locking means mounted on said gate frame near said other side for selectively locking said other side of gate frame to said locking post, said locking post having a slot and said locking means comprises a locking bar and has a portion adapted to be brought into engagement with said slot in said locking post, said locking bar comprising a generally U shaped member having a pair of elongated slats joined together by a plate, each of said slats including an elongated slot at a lower end thereof and having a pin means disposed therethrough into engagement with said gate frame such that said locking bars pivotally and slidably mounted on said gate frame, each slat preventing swinging movement of said gate frame in one direction when said locking bar is in engagement with said locking post.

4,884,615

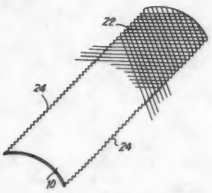
SOUND ABSORBENT SLATS FOR WINDOW BLINDS

Henry C. Hsu, 29-42 162th St., Flushing, N.Y. 11358

Filed Sep. 27, 1988, Ser. No. 249,705

Int. Cl.[4] E06B *9/00*

U.S. Cl. 160—236 **7 Claims**



1. A sound absorbent slat for use in the construction of a window blind, said slat including a substrate in the form of a strip, and, further including a tubular sheath of woven fabric material formed in situ about said strip so as to tightly encapsulate said strip, said tubular sheath providing a continuous coating of a light and sound absorbent material on both of the major surfaces of said strip.

4,884,616

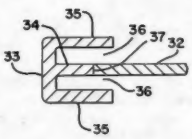
VERTICAL BLIND LOUVER HAVING TRANSPARENT GROOVED SIDE EDGES

Richard A. Setele, Newbury Park, Calif., assignor to Home Fashions, Inc., Santa Monica, Calif.

Filed Sep. 23, 1988, Ser. No. 248,546

Int. Cl.[4] E06B *9/36*

U.S. Cl. 160—236 **20 Claims**



1. A slat, suitable for use as a drapery louver, having an upper surface and a lower surface, having first and second ends, having a central section composed of a first chemical composition having a first melt temperature, and having first and second side edges composed of a second chemical compo-

sition having a second melt temperature substantially different from the first melt temperature, wherein said side edges are fused to said central section each side edge contains a longitudinal groove open to the central section, and said grooves open to the same surface of said slat.

4,884,617

ROLL-UP SHUTTER STRUCTURE

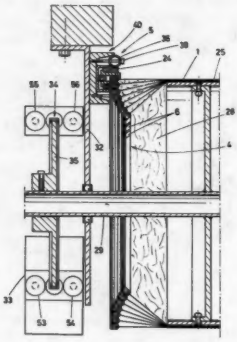
Benoit J. Coenraets, Oude Leuvense Baan 1, B, 1980 Tervuren, Belgium

Filed Dec. 18, 1987, Ser. No. 135,089

Claims priority, application Belgium, Dec. 23, 1986, PVO/217588

Int. Cl.[4] E06B *9/38*

U.S. Cl. 160—271 **27 Claims**



1. A device having a shutter secured to and windable around and unwindable from a rotatable drum and adapted to close an opening by the unwinding of the shutter substantially into a plane, the shutter having flexible side marginal edge portions which project beyond the ends of the drum and each include a series of small closely-spaced flexibly-interconnected substantially rigid substantially identical blocks of greater thickness than that portion of the shutter adjacent thereto laterally inward thereof, said blocks being retained in substantially continuous guideways during the unwinding and winding up of the shutter, the guideways having means incorporated therein at least intermediate the length thereof to enable the blocks to disengage from the guideways when subjected to a predetermined pull substantially transverse to guideway length, each guideway having near but spaced from the drum an access passage through which any blocks which are disengaged from the guideway can reengage the guideway as the shutter winds around the drum.

4,884,618

ROLLER BLIND MOUNTING AND ROLLING SYSTEM

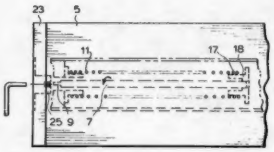
Christopher Steeves, 14 Duncan St., Toronto, Ontario M5H 3G8, Canada

Filed Aug. 5, 1988, Ser. No. 228,498

Int. Cl.[4] A47G *5/02*

U.S. Cl. 160—321 **6 Claims**

1. A roller blind assembly comprising a flexible blind windable on a rotatable blind mount for lowering and raising said blind, said blind having a downward weighting which increases as said blind is lowered with said assembly further including a counter-balancing coil spring acting on said blind mount to produce an upward pull in direct relation to and neutralizing such downward weighting without lifting of said blind, said counter-balancing spring being sleeved on a shaft interiorly of said blind mount and said spring having a first end coupled with said blind mount and a second end coupled with said shaft, said shaft having a blind operating position in which said shaft is fixed against rotation and said blind mount rotates around said shaft to cause winding and unwinding of said spring and a spring adjustment position in which said shaft and said second end of said spring are rotated and said first end of said spring is held against rotation on said blind mount to adjust



tension on said spring according to weight of said blind, said spring providing an axial bias on said shaft to move said shaft to said blind operating position and said shaft being movable against said axis basis to move said shaft to said adjustment position.

4,884,619

KNITTING STICKS MADE OF BAMBOO

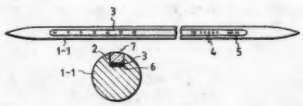
Yoshimori Miyamura, No. 160, Shimokawate, Gifu City, Gifu Prefecture, Japan

Filed Jul. 22, 1988, Ser. No. 222,933

Claims priority, application Japan, Aug. 13, 1987, 61-202110

Int. Cl.[4] B21G *1/12*

U.S. Cl. 163—5 **5 Claims**



1. A method for the production of bamboo-made knitting sticks provided with a gauge scale, which comprises:

processing a bamboo material into a rod of a round or quadratic shape in cross-section,

linearly providing a groove of a concave shape in cross-section in a central surface of said rod,

inserting into and bonding to said groove a scale sheet formed of paper, synthetic resin or metal and bearing length readings in cm or mm,

casting and curing a transparent synthetic resin in said groove to seal said scale sheet in said groove, and

finish-processing the surface of the cured synthetic resin to make it uniformly contiguous to the surface of said bamboo material for a knitting stick without any step therebetween and make the circumference of said knitting stick complete, whereby said scale is seen through the cast and cured transparent synthetic resin.

4,884,620

HOT BOX PROCESS FOR PREPARING FOUNDRY SHAPES WITH CERTAIN AQUEOUS PHENOLIC RESIN SOLUTIONS

Satish S. Jhaveri, Oakville, Canada; William R. Dunnavant, and Helmo J. Langer, both of Columbus, Ohio, assignors to Ashland Oil, Inc., Russell, Ky.

Division of Ser. No. 90,803, Aug. 28, 1987, Pat. No. 4,789,693. This application Oct. 24, 1988, Ser. No. 262,386

Int. Cl.[4] B22C *1/16*

U.S. Cl. 164—15 **25 Claims**

1. A process for preparing a workable foundry shape comprising:

a. heating a foundry mix in a corebox at a temperature suffi-

cient to form a workable foundry shape wherein said foundry mix comprises:

(1) a foundry aggregate;

(2) an effective binding amount of a binder comprising an aqueous basic solution of a phenolic resole resin wherein said aqueous basic solution has

i. a viscosity of less than about 850 centipoise at 25 degrees Celsius;

ii. a solids content of about 35 to about 75 percent by weight, said weight based upon the total weight of the basic solution; and

iii. an equivalent ratio of base to phenolic compound of about 0.2:1.0 to 1.1:1.0; and

(3) an inorganic salt in an amount effective to increase the tensile strength of the foundry shapes prepared with said foundry mix; and

b. removing said workable shape from the corebox.

4,884,621

HYDRAULIC CONTROL METHOD FOR IMPLEMENTS

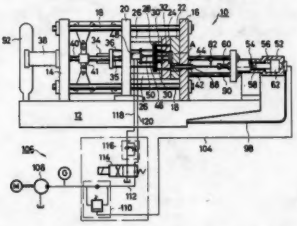
Keisuke Ban; Masakazu Sato; Bakugo Fujito, all of Utsunomiya, and Kousuke Kikuchi, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Kabushiki Kaisha Teisan Industries, both of Tokyo, Japan

Filed Jun. 10, 1988, Ser. No. 205,252

Claims priority, application Japan, Jun. 13, 1987, 63-147712; Aug. 7, 1987, 62-196493

Int. Cl.[4] B22D *18/02*

U.S. Cl. 164—4.1 **12 Claims**



1. A hydraulic control method for implements, comprising the steps of:

employing an accumulator in a first hydraulic conduit;

triggering said first hydraulic circuit resulting in a lowering of an initial operating pressure of said accumulator;

sensing a restoration of the pressure of said accumulator after the lowering of the initial operating pressure; and

triggering a second hydraulic circuit in response to the restoration of the pressure of said accumulator.

10. A hydraulic control method for implements, comprising the steps of:

employing an accumulator having an initial operating pressure in first hydraulic circuit;

triggering said first hydraulic circuit resulting in a lowering of the initial operating pressure of said accumulator;

sensing at least one of an arbitrary operating pressure of the accumulator and a variation of operating pressure of the accumulator during a course of restoration to the initial operating pressure; and

triggering a second hydraulic circuit in response said sensing.

4,884,622

MOULD FOR MOULDING OF A FOUNDRY PATTERN AND PROCESS FOR PUTTING IT INTO PRACTICE

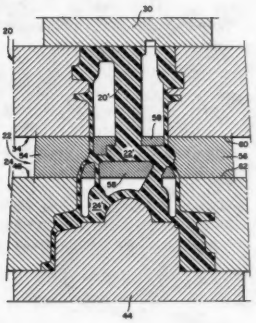
Denis Jouguelet, Raynans, France, assignor to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly, both of, France

Filed Sep. 8, 1988, Ser. No. 241,949

Claims priority, application France, Sep. 11, 1987, 87 12642

Int. Cl.[4] B22C *7/02*

U.S. Cl. 164—45 **6 Claims**



1. Mould for forming a foundry pattern, especially of expanded polystyrene, for an engine cylinder block having several aligned cylinders with parallel axes (X—X), several bearings for mounting a crankshaft, the axis (Y—Y) of the bearings being perpendicular to the axis of the cylinders, voids formed around the cylinders, and recesses between the bearings and the cylinders, the mould comprising three mould segments superposed in the direction of the axes of the cylinders, an upper segment for the prior moulding of an upper part of the pattern including the cylinders and at least one portion of the voids, a lower segment for the prior moulding of a lower part of the pattern including the bearings and at least one portion of the recesses, a central segment for moulding of a central part of the pattern to the upper and lower parts, the central segment including matching portions for the voids of the upper part and matching portions for the recesses of the lower part, means for aligning the upper and lower mould segments, and means for interposing the central segment between the upper and lower segments.

4,884,623

METHOD FOR PRODUCING A GAP SPACER FOR MAGNETIC HEADS

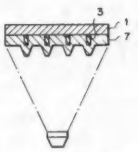
Kunio Suzuki; Masayuki Takamura, and Tadashi Kubono, all of Shizuoka, Japan, assignors to Yamaha Corp., Japan

Filed Dec. 8, 1988, Ser. No. 281,813

Claims priority, application Japan, Dec. 9, 1987, 62-312649

Int. Cl.[4] B22D *23/00*

U.S. Cl. 164—129 **11 Claims**



1. A method for producing a gap spacer for magnetic heads, said method comprising the steps of:

preparing a thin base which is soluble in a specific acid or alkali;

depositing a mask of a prescribed pattern on said thin base in tight surface contact with said thin base;

accumulating a non-magnetic material which is insoluble to said specific acid or alkali on both said thin base and said mask;

removing said mask from said thin base so as to create a plurality of gap spacers of said non-magnetic material on said thin base; and

removing said thin base from said non-magnetic material via solution with said specific acid or alkali so as to create a plurality of non-connected gap spacers.

4,884,624

PROCESS ON A CONTINUOUS CASTING MACHINE TO PRODUCE STRANDS

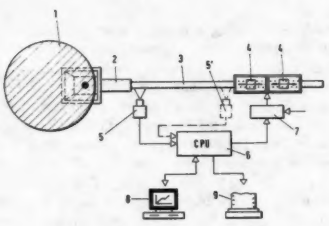
Fritz-Peter Pleschiutschnigg, Duisburg; Joachim Von Schnakenburg, Kempen; Lothar Parschat, Ratingen, and Peter Stadler, Siegen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 315,886

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1988, 3806583

Int. Cl.[4] B22D *11/20*

U.S. Cl. 164—454 **16 Claims**



1. A process for continuously casting a strand from molten metal which is introduced into a tubular mold, said process comprising the steps of:

withdrawing said molten metal from said mold in a partially solidified state to form said strand;

said withdrawing of said strand by a drive unit;

controlling said drive unit with a control signal;

measuring an actual movement of said strand at a location adjacent an exit of said mold;

said measuring of said actual movement to obtain a measurement signal with non-contact sensor means which responds to radiation of said strand without making contact therewith;

comparing said measurement signal with said control signal in an evaluation unit;

providing to said evaluation unit desired information which corresponds to a desired movement of said strand at said location; and

adjusting said control signal by said evaluation unit to adjust said withdrawing by said drive unit to cause said actual movement of said strand at said exit of said mold, as indicated by said measurement signal from said sensor means, to approach said desired movement as indicated by said desired information.

5. Apparatus for controlling a continuous casting machine for producing strands from molten metal, said casting machine including said molten metal being introduced into a tubular mold, said casting machine including a drive unit for withdrawing said molten metal from said mold in a partially solidified state to form said strand, said apparatus comprising:

means for controlling said drive unit;

at least one diode line scan camera located downstream of said mold;

said scan camera measuring a surface of said strand;

means for evaluating including means for comparing a signal from said measuring by said scan camera and a signal from said means for controlling said drive unit; and

said means for evaluating including means for adjusting said means for controlling said drive unit for causing said drive unit to produce a desired speed of said withdrawing of said strand as it passes by said scan camera.

4,884,625

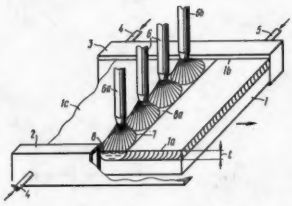
METHOD OF THE PLASMA JET REMELTING OF A SURFACE LAYER OF A FLAT METAL WORK HAVING PARALLEL SIDE EDGES AND APPARATUS FOR CARRYING OUT THE METHOD

Boris E. Paton, ulitsa Chkalova, 41-a, kv. 26; Jury V. Latash, ulitsa Artema, 55, kv. 23; Gennady F. Torkhov, ulitsa Prazhskaya, 3, kv. 456; Nikolai V. Reida, ulitsa Sapernoe pole, 26, kv. 59; Alfred I. Bukalo, ulitsa Petra Zaporozhtsa, 8/2, kv. 69; Vladimir K. Kedrin, ulitsa Sevastopolskaya, 1/1, kv. 35; Gary A. Melnik, ulitsa Prazhskaya, 3, kv. 169, all of, Kiev; Igor S. Pryanishnikov, ulitsa Koreshkova, 15, kv. 5, Elektrostal; Konstantin S. Tolstopyatov, ulitsa Lenina, 7, kv. 21, Elektrostal; Lev R. Tager, prospekt Lenina, 35a, kv. 35, Elektrostal; Mikhail M. Kljuev, ulitsa Mira, 2, kv. 77, Elektrostal; Jury I. Modelkin, prospekt Juzhny, 11, korpus 3, kv. 54, Elektrostal; Boris P. Sokolkin, prospekt Lenina, 10, kv. 88; Alexei K. Andrianov, ulitsa Khokhryakova, 21, kv. 56, both of, Sverdlovsk; Valentin V. Topilin, deceased, late of Elektrostal; by Tatyana V. Topilina, administrator, ulitsa Mira, 6, kv. 29, Elektrostal; Sergei G. Guschin, deceased, late of Sverdlovsk; by Alevtina V. Guschina, administrator, ulitsa Sheinkmana, 45, kv. 148, Sverdlovsk; by Ljudmila S. Korobkova, administrator, ulitsa Sheinkmana, 45, kv. 148, Sverdlovsk, and by Tatyana S. Kuznetsova, administrator, ulitsa Sheinkmana, 45, kv. 148, Sverdlovsk, all of U.S.S.R.

Continuation of Ser. No. 339,418, Jan. 15, 1982, abandoned. This application Aug. 22, 1984, Ser. No. 643,110

Int. Cl.[4] B22D *27/02*

U.S. Cl. 164—495 **16 Claims**



1. A method of plasma jet remelting of a surface layer of a flat metal work having parallel side edges, said method comprising the steps of forming a metal pool on a work positioned in a mold by heating the work through the use of stabilized plasma arcs generated by plasma torches supplied with a plasma forming gas and electric current; and relatively moving the work and the plasma torches along the parallel edges of the work, characterized by the steps of horizontally arranging the work in its starting position in a mold; arranging the plasma torches over the work and over cooled mold walls in a line and across its parallel edges so that the anode spots of the extreme plasma torches in the line are confined between said edges of the work to form a metal pool extending between these edges; and, in the course of the remelting process, relatively moving the plasma torches and the work in a horizontal plane to form a remelted layer of a thickness equal to the depth of the metal pool on the whole surface of the work as the metal pool moves thereof.

11. An apparatus for plasma jet remelting of a surface layer of a flat metal work having parallel side edges, comprising a sealed chamber with a mold for receiving the work, which mold has two cooled walls lying in a horizontal plane and being parallel to one another, and plasma torches arranged within said sealed chamber and communicating with sources of a plasma forming gas, electric current, and cooling water, characterized in that the plasma torches are mounted within the sealed chamber on shafts each of which is journaled in a sealing bush installed in the wall of this chamber so that the center line of each shaft is parallel with said walls of the mold and having a drive for rotating said shafts around their axes, the apparatus being provided with a drive for relatively moving the work and the shafts in a plane parallel with said walls of the mold and along the axes of the shafts connected to at least one of the associated elements.

4,884,626

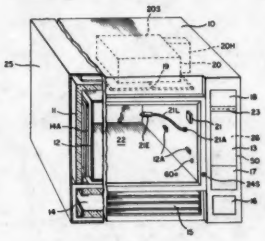
COMBINATION REFRIGERATOR OVEN

Merle M. Filipowski, 237 Beachers Brook La., Cary, N.C. 27511

Continuation-in-part of Ser. No. 846,853, Apr. 1, 1986, abandoned, which is a continuation of Ser. No. 747,797, Jun. 24, 1985, abandoned. This application Aug. 25, 1987, Ser. No. 89,265

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—12 **16 Claims**



1. A self-contained, combination refrigerator-cooking oven for selectively cooling and cooking food in the same enclosed chamber, comprising:

a rigid cabinet of essentially rectangular shape and including top, bottom and vertical side walls, with an open front for the placing of food in the enclosed chamber;

a door mounted on the open front of the cabinet and movable between open and closed positions;

thermal insulating means mounted on inner wall surfaces of the cabinet;

a plurality of cooling coils mounted adjacent the thermal insulating means and at least one of the cabinet walls;

a heat-resistant liner having an open front and mounted inside the insulating means to define, with said door, when said door is in its closed position, the enclosed chamber in which the food is placed;

heating means located adjacent a portion of the heat-resistant liner and at least one of the cabinet wall for heating the enclosed chamber, said heating means including a microwave heater in heating communication with the interior of said enclosed chamber so as to be capable of cooking the food placed in said chamber;

a refrigerating unit mounted in the cabinet and connected to said cooling coils;

temperature control means for monitoring and controlling the temperature of said enclosed chamber;

timing control means for selectively activating said refrigerating unit and said heating means in a preselected timed sequence and for preselected periods to provide, selectively, cooling and cooking of the food;

cooling control means responsive to said temperature control means for controlling said refrigerating unit when said refrigerating unit is activated;

heating control means responsive to said temperature control means for controlling said heating means when said heating means is activated; and

a control panel module mounted in said cabinet and forming respective parts of said temperature, timing, cooling and heating control means, said control panel module including selector switch means for preselecting the sequence in which said refrigerating unit and said heating means subsequently are to operate, and the time and temperature at which said refrigerating unit and said heating means, respectively, are to operate in each operating cycle thereof, so that said cooling control means and said heating control means control said refrigerating unit and said heating means, respectively, to provide, selectively, freezing, cooling of the food without freezing, defrosting, cooking, recooling and warming of the food in any desired sequence.

4,884,627

OMNI-DIRECTIONAL HEAT PIPE

Amir Abtahi, 2649 NW. 28th Terr., Boca Raton, Fla. 33434

Filed Jun. 27, 1988, Ser. No. 211,868

Int. Cl.[4] F28D *15/02*

U.S. Cl. 165—104.26 **14 Claims**

1. An omni-directional heat pipe comprising:

an outer receptacle including an outer skin, an inner skin, and a cavity;

an inner receptacle surrounded by said outer receptacle and including an innermost cavity; and,

a plurality of conduits located between said inner skin and said inner receptacle,

each of said plurality of conduits including a first end and a second end,

said first end in abutting relation with said inner skin,

said second end perforating said inner receptacle and opening into said innermost cavity; and,

means for transferring heat

including a working fluid substantially contained within said conduits.

4,884,628

HEAT PIPE EMPLOYING HYDROGEN OXIDATION MEANS

Chen En-Jian; Lin Zhaorong, and Chen Ly-ying, all of Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences, 81 Central Martyrs' Road, Guangzhou, China

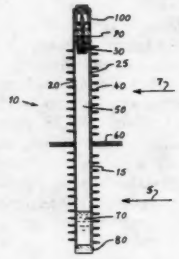
Filed Oct. 19, 1988, Ser. No. 260,210

Int. Cl.[4] F28D *15/02*

U.S. Cl. 165—104.27 **18 Claims**

1. In a heat pipe having an enclosure defining a working cavity and using as a working fluid disposed within the working cavity a vaporizable liquid which released hydrogen upon reaction with the enclosure, the improvement comprising

oxidizer means disposed within the working cavity for oxidizing the hydrogen released from the working fluid into water,



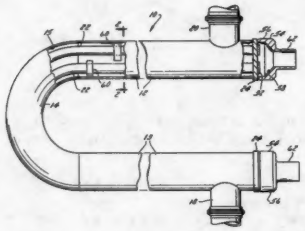
said oxidizer means comprising a mixture of copper and copper oxide.

4,884,629

HIGH PRESSURE MULTIPLE TUBE AND SHELL TYPE HEAT EXCHANGER

Hervé X. Bronnert, 21495 Partridge Ct., Brookfield, Wis. 53005

Filed Feb. 10, 1988, Ser. No. 154,359
Int. Cl.[4] F28D 7/00
U.S. Cl. 165—159 **9 Claims**



1. A high pressure, multiple-tube and shell-type heat exchanger comprising

a substantially U-shaped jacket having a heat exchange medium inlet disposed adjacent one end thereof and a heat exchange medium outlet disposed adjacent a second end thereof,

said jacket being formed of two elongate tubular sections and an identical pair of semi-circular arcuate members sealingly affixed to one end of each of said tubular sections and to each other to form a sealed U-shaped jacket,

a plurality of tubes of heat conductive material arranged in relatively spaced, substantially parallel relation and disposed within said jacket and through which a high pressure product flows,

each tube being a continuous, one-piece tube and having a substantially U-shape conforming substantially to the U-shape of the jacket,

and a tube sheet fixedly sealingly mounted on said end of said jacket, each tube sheet being provided with a plurality of openings aligned with corresponding ends of said tubes,

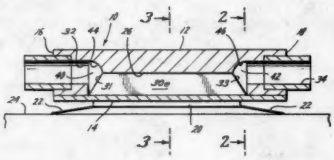
said corresponding ends being aligned in said openings in said tube sheets and sealingly affixed thereto.

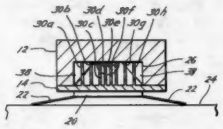
4,884,630

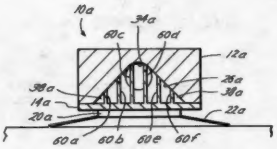
END FED LIQUID HEAT EXCHANGER FOR AN ELECTRONIC COMPONENT

Richard D. Nelson, Austin, Tex., and Omkarnath R. Gupta, Englewood, Colo., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Jul. 14, 1988, Ser. No. 220,758
Int. Cl.[4] F28F 3/14
U.S. Cl. 165—170 **9 Claims**







1. An end fed liquid heat exchanger for an electronic component comprising,

a body having a bottom and first and second ends, said body having a cavity therein,

a plurality of substantially parallel spaced fins positioned in the cavity and connected to the bottom, said fins having first and second ends positioned adjacent the first and second body ends, respectively,

a liquid inlet centrally positioned in the first end of the body with respect to the plurality of spaced fins, and a liquid outlet centrally positioned in the second end of the body with respect to the plurality of spaced fins for flowing cooling liquid between the fins from the first ends to the second ends of the fins with higher flow between the fins in the center, and said body includes a transitional section between the inlet and the cavity and between the outlet and the cavity and the liquid cross-sectional area in the body from the inlet to the outlet, except for the area in the cavity, is substantially the same for minimizing pressure losses.

5. The apparatus of claim 1 wherein the fins in the center of the cavity are spaced closed together than the fins at the edges of the cavity thereby providing a greater heat transfer coefficient at the center of the cavity.

6. An end fed liquid heat exchanger for an electronic component comprising,

a body having a bottom and first and second ends, said body having a cavity therein,

a plurality of substantially parallel spaced fins positioned in

the cavity and connected to the bottom, said fins having first and second ends positioned adjacent the first and second body ends, respectively,

a liquid inlet centrally positioned in the first end of the body, and a liquid outlet centrally positioned in the second end of the body for flowing cooling liquid between the fins from the first ends to the second ends of the fins with higher flow between the fins in the center, and

a curved and tapered transitional section between the inlet and cavity and between the outlet and the cavity for avoiding abrupt liquid direction changes and abrupt liquid cross-sectional changes.

8. An end liquid heat exchanger for an electronic component comprising,

a body having a bottom and a first and second ends, said body having a cavity therein,

a plurality of substantially parallel spaced fins positioned in the cavity and connected to the bottom, said fins having first and second ends positioned adjacent the first and second body ends, respectively,

a liquid inlet centrally positioned in the first end of the body, and a liquid outlet centrally positioned in the second end of the body for flowing cooling liquid between the fins from the first ends to the second ends of the fins with higher flow between the fins in the center, said cross-sectional shape of the cavity is triangular.

9. An end fed liquid heat exchange for an electronic component comprising, a body having a bottom and first and second ends, said body having a cavity therein,

a plurality of substantially parallel spaced fins positioned in the cavity and connected to the bottom for cooling an electronic component positioned against the bottom, said fins having first and second ends positioned adjacent the first and second body ends, respectively,

a liquid inlet centrally positioned in the first end of the body, and a liquid outlet centrally positioned in the second end of the body for flowing cooling liquid between the fins from the first ends to the second ends of the fins with higher flow between the fins in the center,

said body including a curved and tapered transitional section between the inlet and the cavity and between the outlet and the cavity for avoiding abrupt liquid direction changes and abrupt liquid cross-sectional area changes, and

said liquid cross-sectional area in the body from the inlet to the outlet is substantially the same for minimizing pressure losses except for the cross-sectional area in the cavity which is approximately one-half of the other areas.

4,884,631

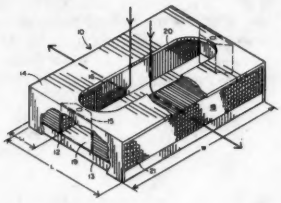
FORCED AIR HEAT SINK APPARATUS

Wally E. Rippel, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Mar. 17, 1988, Ser. No. 170,378

Int. Cl.[4] F28F *3/02;* H01L *23/36*

U.S. Cl. 165—185 **12 Claims**



1. A heat sink assembly of the type receiving an electrical component in intimate engagement for dissipating heat generated by such component, such heat dissipation being promoted by forced air flow through the assembly; the assembly comprising:

a top plate having a first surface for receiving said component and a second surface for receiving fin structures;

a plurality of fin structures each bonded to said second surface of said top plate and extending therefrom;

at least two of said fin structures being in relative spaced relation to form an air inlet path therebetween whereby an air flow into said inlet between said two fin structures is divided, with a respective portion of said air flow being directed through each of said two fin structures; and

a cover plate partially enclosing said fin structures and having an opening adjacent said air inlet;

wherein said fin structures are formed of a serpentine structured material.

4,884,632

SIDE ENTRY SUB WELL LOGGING APPARATUS AND METHOD

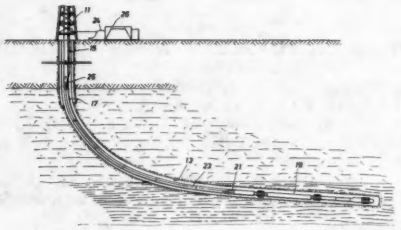
Emmitt E. Rankin, Fort Worth, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Division of Ser. No. 69,289, Jul. 1, 1987, Pat. No. 4,790,377, which is a division of Ser. No. 837,383, Mar. 7, 1986, Pat. No. 4,678,038, Continuation of Ser. No. 69,289, Jul. 1, 1987, Pat. No. 4,790,377. This application Jul. 6, 1988, Ser. No. 216,580

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.[4] E21B *17/046*

U.S. Cl. 166—65.1 **2 Claims**



1. In a well logging system in which conductor cable extends outside of a drill string assembled of drill pipe and a side entry sub, the cable entering into a sidewall passage of the side entry sub and extending through the drill pipe to a logging instrument located at the lower end of the drill string, an apparatus for releasing the side entry sub from the drill string in the event the drill string becomes stuck, the apparatus comprising:

(a) a release sub having a telescoping joinder means connecting to the drill string below the side entry sub; and

(b) means for releasably latching the side entry sub to the release sub serially with the drill string, said latching means releasing the side entry sub from the release sub without rotation to enable the side entry sub to be pulled upwardly from the drill string.

4,884,633

A HYDRAULIC REMOTELY-CONTROLLED BLEEDER VALVE FOR A WELL HEAD

Jean-Yves Le Gac, Beynes; Denis Devilleger, Marcq, and Philippe Majewski, Sorel-Moussel, all of France, assignors to Gaz de France, Paris, France

Filed Jan. 27, 1989, Ser. No. 303,208

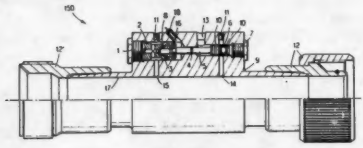
Claims priority, application France, Jan. 28, 1988, 88 00996

Int. Cl.[4] E21B *34/02;* F16K *31/163*

U.S. Cl. 166—75.1 **7 Claims**

1. A bleeder for a pressure lock of a well head giving access to an underground store of gas, the bleeder comprising a hydraulically remotely controlled bleed valve and means for

guaranteeing that gas exhaust takes place during bleeding away from the well head zone, and the bleed valve comprising a valve body defining a main channel of sufficient cross-section to pass a wireline tool and connected at one of its ends to one component of the pressure lock and at its other end to an assembly fixed to the well head or to an assembly for connection to a control system for a wireline tool, a gas exhaust lateral orifice for being put selectively into communication with a first transverse channel opening out into the main channel by means of a closure member constituted by a valve seat and a valve



member formed at one end of a piston, a second transverse channel putting the main channel into communication with a rear face of the piston, said rear face having a greater cross section that its valve-forming front face, and a lateral hydraulic fluid receiving control orifice connected to a hydraulic remote control flexible hydraulic pipe and opening out into a bore defining an annular space around a portion of the piston, said bore being of smaller cross section than the rear face of the piston in contact with the gas present in said second transverse channel.

4,884,634

PROCESS FOR INCREASING THE DEGREE OF OIL EXTRACTION

Olav Ellingsen, Floro, Norway, assignor to Industrikontakt Ing. O. Ellingsen & Co., Floro, Norway

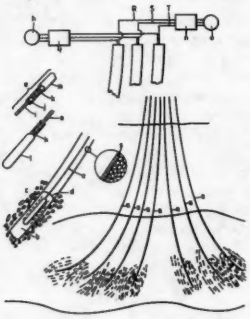
PCT No. PCT/NO86/00080, § 371 Date Jul. 8, 1987, § 102(e) Date Jul. 8, 1987, PCT Pub. No. WO87/03643, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 3, 1986, Ser. No. 84,793

Claims priority, application Norway, Dec. 3, 1985, 854852

Int. Cl.[4] E21B *43/25*

U.S. Cl. 166—248 **4 Claims**



1. A process for increasing the degree of extraction of oil or other volatile liquids in oil reservoirs on land or at sea, by making the formations in said reservoirs vibrate as close to the natural frequency of said formations as possible, so that the binding forces between the formations and oil are degraded, and by electric stimulation by means of electrodes placed in at least two adjacent well bores, the improvement comprising filling a well bore with a metallic liquid in a height zone corresponding to the height of the formation, vibrating said metallic liquid by means of an inserted vibrator, and at the same time performing an electric stimulation by applying an alternating electric current to said electrodes.

4,884,635

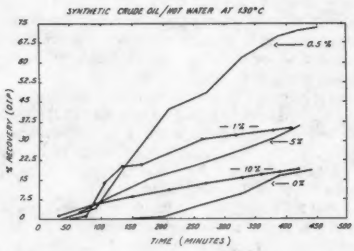
ENHANCED OIL RECOVERY WITH A MIXTURE OF WATER AND AROMATIC HYDROCARBONS

Alexander S. McKay, Las Vegas, Nev.; Declan B. Livesey, Calgary, and Philip Harris, Edmonton, both of Canada, assignors to Texaco Canada Resources, Alberta, Canada

Filed Aug. 24, 1988, Ser. No. 235,414

Int. Cl.[4] E21B *43/24, 43/26*

U.S. Cl. 166—271 **6 Claims**



1. A method of recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well, which comprises:

injecting into the formation a mixture of hot water and about 0.1% to about 10% by weight of a hydrocarbon liquid having an aromatic content greater than about 30%,

said hot water and hydrocarbon mixture injected at a temperature higher than about 80° C.; and

recovering hydrocarbons and other fluids at a production well.

4,884,636

DELAYING THE GELATION OF WATER SOLUBLE POLYMERS

Naim A. Mumallah, and Ahmad Moradi-Araghi, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

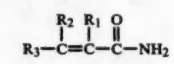
Division of Ser. No. 10,507, Feb. 3, 1987, Pat. No. 4,822,842. This application Dec. 1, 1988, Ser. No. 279,489

Int. Cl.[4] E21B *33/138*

U.S. Cl. 166—295 **10 Claims**

1. In an enhanced oil recovery process wherein the water permeability of selected portions of an underground formation is decreased by injecting a gelable composition containing;

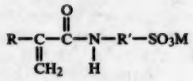
from 0.1–5 wt % of a water soluble polymer wherein said water soluble polymer contains from 5 to 100 mole percent of a monomer selected from those monomers represented by the following formula



(I)

wherein R_1, R_2, and R_3 are selected from the group consisting of hydrogen of alkyl groups containing from 1 to 3 carbon atoms; and from 0 to 95 mole percent of a monomer selected from the group consisting of;

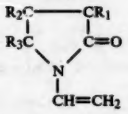
(A) those monomers which can be represented by the formula



(II)

wherein R is selected from the group consisting of hydrogen or alkyl radicals containing from 1 to 6 carbon atoms, R' is selected from the group consisting of alkylene radicals containing from 1 to 6 carbon atoms or an arylene radical containing from 6 to 10 carbon atoms, and M is selected from the group consisting of hydrogen, ammonium, potassium, or sodium,

(B) those monomers represented by the following formula,



(III)

where R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen or alkyl radicals containing from 1 to 2 carbon atoms; and

(C) those monomers selected from the group consisting of acrylic acid, methacrylic acid, vinylsulfonic acid, vinylbenzylsulfonic acid, vinylbenzenesulfonic acid, vinyl acetate, arylonitrile, methyl acrylonitrile, vinyl alkyl ether, vinyl chloride, maleic anhydride, vinyl substituted cationic quaternary ammonium compounds (acryloyloxyethyl)dimethylmethylammonium methyl sulfate, sodium acrylate; and

(D) mixtures thereof;

from 0.03–1.2 wt % of a water dispersible aldehyde;

from 0.01–2 wt % of a phenolic compound; and

from 92–99.9 wt % of water;

the improvement which comprises:

pumping into an underground formation, prior to gelling, said gelable composition containing said water soluble polymer, said water dispersible aldehyde, said phenolic compound, water, and a metal ion selected from the group consisting of Fe^{2+}, Fe^{3+}, Cu^{2+}, Co^{3+}, Ni^{2+}, Sn^{4+}, Ti^{4+}, Zn^{2+}, V_{3+}, and Zr^{4+}, wherein said metal ion is present in an amount sufficient to delay the gelling of said gelable composition, in a manner which facilitates the contacting of said water soluble polymer, said water dispersible aldehyde, said phenolic compound, water, and said metal ion thereby delaying the gelling of said gelable composition.

4,884,637

GROUND/TURF AERATOR

Brian J. Rohleder, Twyford Road, RD 5, Hastings, New Zealand

Filed Nov. 20, 1987, Ser. No. 123,264

Claims priority, application New Zealand, Jul. 23, 1987, 221176

Int. Cl.[4] A01B *45/02*

U.S. Cl. 172—22 **11 Claims**

1. Ground coring and/or aerating apparatus comprising:

a frame movable over the ground in a direction of advancement;

a crank assembly mounted on said frame;

means providing a transmission of power to said crank assembly carried by said frame;

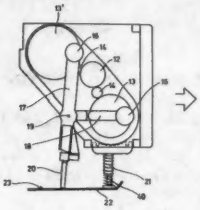
ground coring support means mounted on said frame and driven by said crank assembly;

ground coring means mounted on said ground coring support means and dependent therefrom, so that the action of said crank assembly periodically presses said ground coring means into the ground and withdraws the same therefrom while the frame advances; and

skid means supported on and dependent from said frame comprising

a skid having a forward part and a closed rear part and a bottom ground pressuring surface,

at least one opening in said skid through which said ground coring means passes when pressed into the ground and



from which said ground coring means is withdrawn when withdrawn from the ground,

a rear portion on said at least one opening, and

trailing guide means on said skid at said rear portion of said at least one opening for guiding uplifted soil and turf downwardly through said at least one opening and under said bottom surface of said skid.

4,884,638

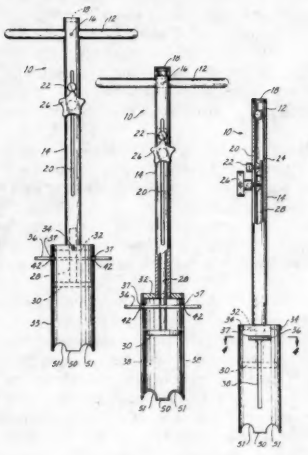
SOIL CORING DEVICE WITH A CORE EJECTOR MECHANISM

Michael R. Hoffman, 339 Bayview Dr. NE., St. Petersburg, Fla. 33704

Filed May 3, 1989, Ser. No. 346,916

Int. Cl.[4] E21B *25/00*; A63B *57/00*; A01B *45/04*

U.S. Cl. 172—22 **8 Claims**



1. A soil coring device and core ejector mechanism for golf course greens comprising, a cylindrical cutting tube having a lower cutting edge and opposed longitudinally extending guide slots with connecting circumferentially extending locking slots, a foot engageable ejector plate slidably received in said slots and extending laterally beyond each side of the cutting tube, a support tube having a longitudinally oriented clamping slot on one side thereof, said support tube being attached at one end to said cutting tube and having a perpendicularly extending operator handle secured at its opposite end, an elongated slidable rod having one end terminating

within said support tube and a second end extending freely through said ejector plate and secured to a circular tamping plate located within said cutting tube below the ejector plate, clamping means associated with said clamping slot for adjustably clamping said rod, and an adjustable stop means associated with said support tube adapted to contact an abutment on said rod to preset the position of the tamping plate with respect to the cutting edge.

4,884,639

DEVICE FOR CONNECTING WORKING IMPLEMENT TO TRACTOR

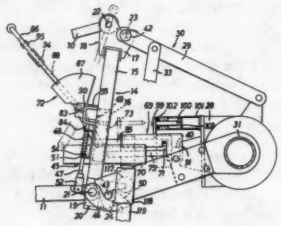
Kenkichi Nozaka; Yoshiro Kawahara, and Takashi Fukutaka, all of Osaka, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Mar. 11, 1988, Ser. No. 167,184

Claims priority, application Japan, Mar. 19, 1987, 62-66658; Mar. 19, 1987, 62-66659

Int. Cl.[4] A01B *59/06*

U.S. Cl. 172—47 **19 Claims**



1. A device for connecting a working implement to a tractor having a liftable three-point link assembly comprising:

a central top link and a pair of opposed side lower links, a connecting assembly interconnecting said top link and said lower links at rearward ends thereof;

said tractor being provided with a lifting unit for raising and lowering the three-point link assembly and the connecting assembly, the connecting assembly comprising:

an upper connector positioned above a widthwise midportion and a pair of lower connectors positioned at opposite sides;

said lower connectors being releasably engaged with corresponding connectable portions of the implement when the connecting assembly is raised with the upper connector engaged;

an extendable transmission shaft extending between a power take off shaft of the tractor and an input shaft of the working implement substantially longitudinally of the tractor;

said transmission shaft having at opposite ends a tractor joint and an implement joint, the tractor power take off shaft having an externally splined portion removably operatively fitted in an internally splined portion of the tractor joint, the implement input shaft having an externally splined portion removably operatively fitted in an internally splined portion of the implement joint;

said connecting assembly being provided with a clutch for selectively operatively connecting the implement joint to the implement input shaft;

said clutch comprising guide means positioned substantially longitudinally of the tractor and fixed to the connecting assembly;

a tubular case having an axis extending substantially longitudinally of the tractor and supported by slide members on the guide means movably in the axial direction; and

a remotely actuated operating assembly for the tubular case, the tubular case having the implement joint inserted therein and being movable axially thereof while extending or contracting the transmission shaft to thereby shift the implement joint is operatively connected to the implement input shaft and a separating position where the implement joint is separate from the input shaft, each of the slide members being provided with a spring for holding the tubular case on the guide means translatably and swingably in an upward or downward direction, the operating assembly being selectively operable to shift the tubular case and the separating position to the connecting position after the upper and lower connectors of the connecting assembly are respectively held by the upper and lower connectable portions of the working implement in engagement therewith.

4,884,640

SOIL CULTIVATING IMPLEMENTS

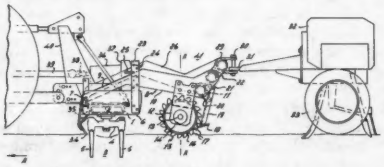
Ary van Der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Continuation of Ser. No. 797,498, Nov. 13, 1985, abandoned. This application Oct. 27, 1988, Ser. No. 263,972

Claims priority, application Netherlands, Nov. 13, 1984, 8403460

Int. Cl.[4] A01B *49/02*

U.S. Cl. 172—68 **25 Claims**



1. A soil cultivating implement comprising an elongated frame portion that is moveable over the ground and extends transverse to its intended direction of operative travel, a plurality of rotary soil working members carried by said frame portion in a successively neighboring relationship with one another, arm means freely pivotally connected at one end to a forward aspect of said frame portion and extending rearwardly from said frame portion, an adjustable stop and guide means at a rear aspect of said frame portion for limiting downward rotation of said frame portion, and a ground-roller disposed rearwardly of said soil working members relative to said direction of operative travel and also extending transverse to that direction, said ground-roller being attached to said arm means so as to provide a pivotal fulcrum for said arm means such that said arm means while pivotally sustaining said forward aspect of said frame portion relative to the ground surface during the implement's operation provides a vertically directed force to the forward aspect of said frame portion while permitting said frame portion rearward of the freely pivotal connection to move upwardly relative to said arm means, said arm means having an arm portion extending rearward of said ground-roller, said arm means, by means of a mass attached to said arm means and located at a distance from a vertical plane through the axis of rotation of said ground-roller, providing a selected vertical component of force, said selected vertical component of force exerting by way of said fulcrum created by said ground-roller a further vertical force, which may be positive or negative depending upon the selected vertical component of force, upon said forward aspect of said frame portion including said soil working members carried by said frame portion.

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BACKHOE HAMMER

Steven S. Kendall, Davison, Mich., assignor to Genesee Polymers Corporation, Flint, Mich.

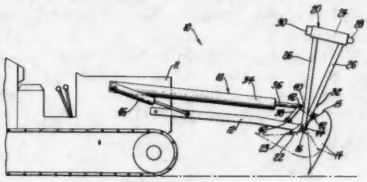
Filed Dec. 30, 1985, Ser. No. 814,875

Int. Cl.[4] B23B *45/16*

U.S. Cl. 173—94 **12 Claims**

1. A backhoe assembly (10) comprising; a boom means (12) for pivotal attachment to a machine (11), a bucket (14) pivot-

ally supported by said boom means (12) for rotation about a support axis (16), actuation means (18) for raising and lowering said boom means (12) and for rotating said bucket (14) about said support axis (16) between open and closed positions, characterized by hammer means (20) supported in a cantilevered



fashion for pivotal movement about said support axis (16) by said bucket (14) between a cocked position on a cocked side of an over-center position and a released free-fall position on the other side of the over-center position.

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PERCUSSIVE ACTION MACHINE

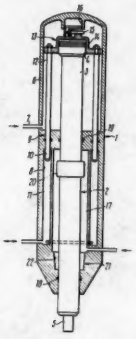
Petr Y. Fadeev; Vladimir Y. Fadeev; Vladlen V. Korobkov; Rim A. Kulagin, and Nikolai P. Emilov, all of Novosibirsk, U.S.S.R., assignors to Institut Gidrokinamiki Im, Lavrentieva, Novosibirsk, U.S.S.R.

PCT No. PCT/SU86/00141, § 371 Date Aug. 24, 1986, § 102(e) Date Aug. 24, 1986, PCT Pub. No. WO88/05115, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 24, 1986, Ser. No. 266,630

Int. Cl.[4] B23B *45/16*

U.S. Cl. 173—139 **3 Claims**



1. A percussive action machine for changing the shape of solid objects comprising a housing (1) accommodating a hammer (2) capable of reciprocations therein and having a front portion provided with a tool (5) for impact engagement with the solid object to be crushed, a tail piece (3) with a piston-like projection (4) inside a power cylinder (6) attached to the housing (1) and filled with a compressible fluid, and a midportion provided with an annular projection disposed inside a hammer decelerating cavity (17) of the housing (1) occupied by a non-compressible liquid fluid, the front part of this cavity being a hammer deceleration chamber (21) per se having a cross-sectional area substantially equal to the cross-sectional area of the annular projection (20) of the hammer (2), a side surface of the hammer deceleration chamber (21) and/or that of the annular projection (20) is tapered with the larger base of the taper facing the side opposite to the travel path of the hammer (2) as it decelerates, whereas the length of the tapered surface is greater than the length of the deceleration travel of the hammer (2), and comprising, inter alia, a drive for executing the return stroke of the hammer (2) including hydraulic cylinders (8) secured at the periphery of the housing (1), rods (9) of these hydraulic cylinders (8) entering by ends (10) thereof hydraulic interiors (11) of their cylinders (8), other ends (12) of these rods (9) entering the interior of said power cylinder (6) to be connected to a grip mechanism (13) adapted for engagement with the piston-like projection (4) of the hammer (2) for executing the return stroke, characterized in that the hammer deceleration chamber (21) is provided with a movable cup (25) the bottom of which has a hole wherethrough the hammer (2) extends, and through holes (26) extending to the outer surface of the cup bottom capable of being brought into close contact with an end wall of the hammer deceleration chamber (21), the cup (25) being also capable of limited displacement relative to the housing (1).

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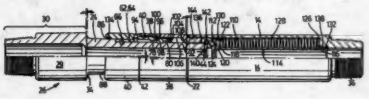
DOWNHOLE ADJUSTABLE BENT SUB

Mike Wawrzynowski, and Don Ruckman, both of Edmonton, Canada, assignors to 392534 Alberta Ltd., Edmonton, Canada

Filed Jan. 17, 1989, Ser. No. 297,360

Int. Cl.[4] E21B *7/08, 7/10*

U.S. Cl. 175—74 **8 Claims**



1. A downhole adjustable bent sub for use in a drilling process having a drill bit subject to a drilling force, said downhole adjustable bent sub comprising:

a tubular housing having an upper part and a lower part, said upper part having an upper longitudinal axis, said lower part having a lower longitudinal axis, said upper and lower parts being joined at a first bend with said upper and lower longitudinal axes intersecting at an angle, said upper part of said housing having a top end distal said first bend;

a tubular mandrel having a first part and a second part, said first part having a first longitudinal axis and said second part having a second longitudinal axis, said first and second parts being joined at a second bend with said first and second longitudinal axes intersecting at an angle, said first part of said mandrel having a first end distal said bend, said first part of said mandrel adjacent said first end being disposed within said lower part of said housing and longitudinally slidable therein;

a longitudinal stop limiting displacement of said mandrel away from said top of said housing; longitudinal biasing means urging said mandrel away from said top of said housing toward a first position where said longitudinal stop prevents further displacement of said mandrel away from said top of said housing; said mandrel having a second position in which said mandrel is displaced toward said top of said housing;

a rotational stop preventing relative rotation between said first part of said mandrel and said lower part of said housing when said mandrel is in said first position, and allowing such relative rotation when said mandrel is in said second position; and,

a rotator acting between said mandrel and said housing, said rotator reacting to longitudinal displacement between said mandrel and said housing to cause a predetermined amount of relative rotation between said first part of said mandrel and said lower part of said housing when said mandrel is displaced from said first position to said second position and returned to said first position.

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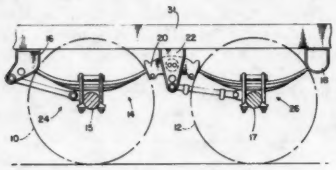
VEHICLE ON-BOARD TRANSDUCER FOR USE WITH DUAL AXLE EQUALIZER HANGER SYSTEMS

Keith W. Reichow, Renton, Wash., assignor to Stress-Tek, Inc., Renton, Wash.

Filed Mar. 28, 1989, Ser. No. 329,773
Int. Cl.[4] G01G *19/08, 3/14*
U.S. Cl. 177—137 **13 Claims**



1. An on-board weighing system for vehicles with dual axles, comprising:

an equalizer structure forming part of the suspension system of the vehicle for equalizing the load between the dual axles thereof, the equalizer structure comprising front and rear hanger elements, an itermediate load equalizer connected to the front and rear hanger elements by another portion of the vehicle suspension system and an equalizer hanger connected to the intermediate load equalizer, such that a portion of the vertical load on the dual axles acts through at least one of (1) the equalizer, and (2) the equalizer hanger; and

transducer means, including strain gauges, mounted at selected locations on one of (1) the equalizer and (2) the equalizer hanger in such a manner as to provide an output signal, in response to a load on the dual axles, which is an accurate indication of the total vertical load on the dual axles.

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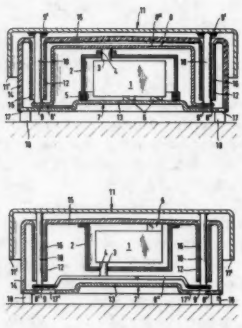
PRECISION BALANCE WITH SCALE ON TOP

Erich Knothe, Eddigehausen, and Franz-Josef Melcher, Hardegsen, both of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Mar. 15, 1989, Ser. No. 323,892
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810469
Int. Cl.[4] G01G *21/28*
U.S. Cl. 177—180 **10 Claims**



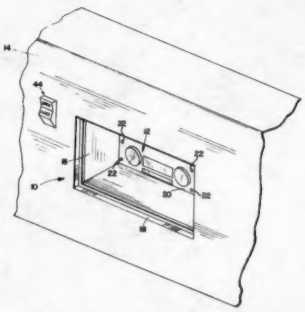
1. An electronic precision balance with the weighing surface on top, protected against the penetration of foreign bodies and with a low-displacement measuring system, a parallel-guided balance scale carrier for a balance scale which is guided through a housing opening of a surrounding system housing or protective cap, comprising in that the balance scale carrier (3) is designed for its part with its part running without contact through an opening (4) upward outside of the system housing (2) as a protective hood (8) which covers the system housing (2) at least at the top and the sides and which comprises receiving bearings (9) at the low hood edge (8') for intermediary members (10) which support the balance scale (11) and that said intermediary members are surrounded without contact by casings (12) which form foreign-body baffles open at the top and the bottom which are a component of a general housing (7) surrounding the system housing (2) and that said general housing comprises drainage openings (17,17') located in its low bottom parts.

4,884,646

ANTI-THEFT DEVICE FOR AUTOMOBILE AUDIO EQUIPMENT

Robert A. Zambias, 4 Mapes Ave., Springfield, N.J. 07081

Filed Jul. 18, 1988, Ser. No. 220,526
Int. Cl.[4] B60K *35/00, 37/06*
U.S. Cl. 180—90 **19 Claims**



1. An anti-theft device for electronic equipment which is accessible through an opening in a frame of a vehicle, comprising:

a sliding door movable between a closed position in blocking relation to said opening and an open position permitting acceess to said electronic equipment through said opening;

trackway means for guiding movement of said sliding door between said open and closed positions;

motor drive means connected with said frame for driving said sliding door between the open position and the closed position;

means for drivingly connecting the motor drive means to the sliding door; and

actuation means for selectively actuating said motor drive means to cause said sliding door to move along said trackway means between said open and closed positions.

4,884,647
REAR WHEEL STEERING APPARATUS

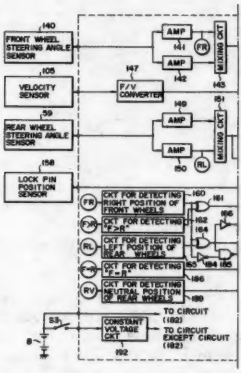
Tetsushi Mimuro, Nagoya; Hiroki Abe, Okazaki; Masahiro Honda, Nukata, and Takeshi Mitsui, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

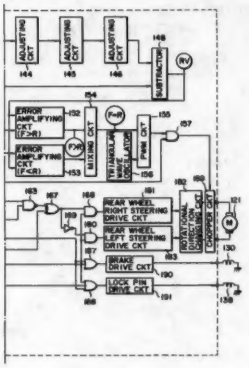
Continuation of Ser. No. 705,921, Feb. 26, 1985, abandoned. This application Nov. 30, 1987, Ser. No. 127,618

Claims priority, application Japan, Nov. 21, 1983, 58-179923; Nov. 30, 1983, 58-184861; Nov. 30, 1983, 58-184860; Nov. 30, 1983, 58-184851; Nov. 30, 1983, 58-184853; Nov. 30, 1983, 58-184854; Feb. 28, 1984, 59-27560; Jan. 29, 1985, 60-14954

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—140 **27 Claims**





1. A rear wheel steering apparatus for a vehicle having steerable front and rear wheels comprising:

driving condition detecting means including,

front wheel steering angle detecting means for detecting a front wheel steering angle of said vehicle and generating a signal corresponding to the front wheel steering angle, and

rear wheel steering angle detecting means for detecting a rear wheel steering angle of the vehicle and generating a signal corresponding to the rear wheel steering angle;

rear wheel steering control means for steering said rear wheels, including,

a first cylinder housing,

a first piston member adapted to reciprocate within said cylinder housing and coupled to the rear wheels,

a selector control valve for selectively causing a pressure source and a tank to communicate with two chambers defined in said first cylinder housing by said piston member, and

a steering mechanism which is arranged between said selector control valve and said two chambers and which has check valves allowing a flow-in operation for one of said two chambers and simultaneously a flow-out operation for the other of said two chambers, said steering control means being adapted to control said steering mechanism; and

rear wheel steering control means including,

discriminating means for discriminating a difference between said front and rear wheel steering angle signals from said front and rear wheel steering angle detecting means, and

steering control means, responsive to said decriminating means, for supplying a steering signal to said rear wheel steering means to eliminate the difference between said front and rear wheel steering angles when the difference exceeds a predetermined value.

4,884,648
VARIABLE ASSIST POWER STEERING SYSTEM WITH VARYING POWER ASSIST CHARACTERISTIC

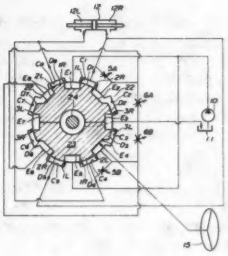
Koh Uchida, Sagamihara; Takashi Kurihara, Atsugi, and Makoto Miyoshi, Kawasaki, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 28, 1987, Ser. No. 138,480

Claims priority, application Japan, Dec. 27, 1986, 61-313519

Int. Cl.[4] B62D *5/083, 6/02*

U.S. Cl. 180—142 **4 Claims**



1. A variable assist power steering system for vehicles including a hydraulic fluid source, a fluid reservoir, and a hydraulic pressure operated power cylinder adapted to be connected to a steering linkage, comprising:

a control valve including valve elements relatively displaceable in response to a first predetermined variable to define therebetween two parallel fluid flow paths connected between the fluid source and the fluid reservoir to produce a pressure difference in the power cylinder in response to said first predetermined variable; wherein

each of said plurality of parallel fluid flow paths are connected to the power cylinder and divided into an upstream portion fluidly disposed between the hydraulic fluid source and the power cylinder and a downstream portion fluidly disposed between the power cylinder and the fluid reservoir,

said valve elements define a plurality of main variable flow orifices serially arranged in at least one of said upstream and downstream portions of each of said two parallel fluid flow paths

said control valve comprises a plurality of bypass paths

connected in parallel to said plurality of main variable flow orifices, respectively, each of said plurality of bypass paths including an externally controlled variable flow orifice valve which has an orifice area which is variable in response to a second predetermined variable different from said first predetermined variable.

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CRUISE CONTROL APPARATUS

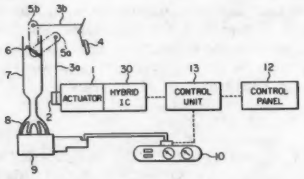
Masayoshi Onishi; Yasuo Naitou, and Takeshi Yasukawa, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 15, 1987, Ser. No. 96,450

Claims priority, application Japan, Sep. 18, 1986, 61-222516; Sep. 18, 1986, 61-222517; Sep. 18, 1986, 61-222518

Int. Cl.[4] B60K *31/00*

U.S. Cl. 180—179 **1 Claim**



1. A cruise control apparatus for an automobile comprising:

a motorized actuator with an electric motor having a rotating output shaft;

means for opening and closing the throttle valve of the engine of said automobile in accordance with the angle of rotation of said rotating output shaft;

means for producing a cruise speed signal corresponding to the cruise speed desired by the driver of said automobile; and

control means responsive to the actual speed of said automobile and said cruise speed signal for controlling the angle of rotation of the output shaft of said electric motor such that the degree of opening of said throttle valve is maintained at a value at which the speed of said vehicle is approximately equal to the cruise speed desired by said driver, said control means including a motor control circuit for said electric motor, wherein at least a portion of said motor control circuit is a hybrid integrated circuit which is mounted on said motorized actuator and which is connected to the electric motor to control the angle of rotation of the output shaft of the electric motor by short wiring comprising ends of stator windings of the electric motor.

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SLIP DETECTING SYSTEM FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

Haruo Fujiki, and Kazunari Tezuka, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,810

Claims priority, application Japan, Oct. 26, 1987, 62-271057

Int. Cl.[4] B60R *17/34*

U.S. Cl. 180—197 **3 Claims**

1. A system for detecting a slip of four wheels of a four-wheel drive motor vehicle, comprising:

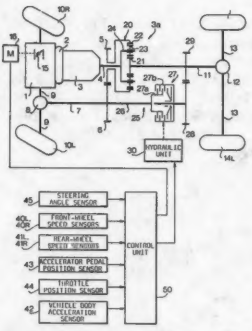
front speed detector means for detecting front-wheel speed and for producing a front-wheel speed signal;

rear speed detector means for detecting rear-wheel speed and for producing a rear-wheel speed signal;

speed difference detector means for detecting the difference between the front-wheel speed and the rear-wheel speed and for producing a speed difference signal when the difference is larger than a predetermined value;

wheel acceleration calculator means responsive to the front-wheel speed signal and the rear-wheel speed signal for calculating wheel acceleration;

vehicle acceleration detector means for detecting vehicle body acceleration;



slip detector means for detecting acceleration difference of the wheel acceleration from the vehicle body acceleration at nonexistence of the speed difference signal and for producing a four-wheel slip signal when the acceleration difference is larger than a predetermined value.

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VEHICLE SLIP CONTROL APPARATUS

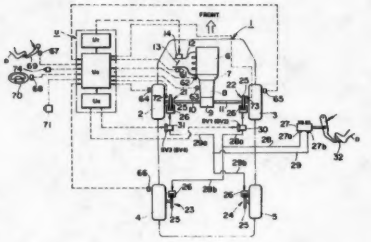
Yasuhiro Harada; Kazutoshi Nobumoto; Eizi Nishimura, and Toru Onaka, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 21, 1987, Ser. No. 76,172

Claims priority, application Japan, Jul. 24, 1986, 61-172700; Jul. 30, 1986, 61-177776

Int. Cl.[4] B60K *31/00*

U.S. Cl. 180—197 **20 Claims**



1. A vehicle slip control apparatus for preventing an excessive degree of slippage or spinning by a driven wheel on a road surface by controlling a torque transmitted to the driven wheel, the slip control apparatus comprising:

output torque adjusting means for adjusting an output torque of a power source functioning as a source of the output torque;

braking force adjusting means for adjusting a braking force of a brake for the driven wheel;

slip detecting means for detecting a degree of slippage of the driven wheel on the road surface;

first slip control means for controlling said braking force adjusting means so as to allow the degree of slippage detected by said slip detecting means to reach a first target value, said first slip control means being operable when

the degree of slippage detected by said slip detecting means is equal to or larger than a predetermined value;

second slip control means for controlling said output torque adjusting means so as to allow the degree of slippage detected by said slip detecting means to reach a second target value, said second slip control means being operable when the degree of slippage detected by said slip detecting means is equal to or larger than a predetermined value;

control ratio altering means for altering a control ratio of the first target value to the second target value by changing at least one of the first and second target values when slip control is executed using both the first and the second slip control means;

instruction means for providing an instruction to said control ratio altering means to alter said control ratio in accordance with requirements for driving the vehicle.

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APPARATUS FOR USING THE IMPACT ENERGY OF A VEHICLE FOR A SAFETY DEVICE FOR THE PROTECTION OF PASSENGERS

Elmar Vollmer, Wettstetten, Fed. Rep. of Germany, assignor to Audi AG, Ingolstadt, Fed. Rep. of Germany

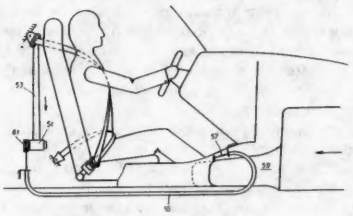
PCT No. PCT/DE84/00213, § 371 Date Aug. 8, 1985, § 102(e) Date Aug. 8, 1985, PCT Pub. No. WO85/01707, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 12, 1984, Ser. No. 749,532

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337232

Int. Cl.[4] B60K *28/14;* B62D *1/18;* B60R *22/20*

U.S. Cl. 180—274 6 Claims



1. An apparatus for enhancing the safety of a passenger in a vehicle of the kind having a chassis and drive means mounted in a forward section thereof for movement, when in a frontal collision of predetermined force, in a rearward direction relative to said chassis, comprising:

a seat belt for retaining said passenger in a predetermined position and having a first portion extending generally forwardly of said passenger and a second portion extending generally rearwardly of said passenger;

means for securing said first portion of said seat belt to said chassis rearward of said forward section thereof;

retaining means for yieldably extending and retracting said second portion of said seat belt;

flexible substantially unstretchable means having a first section connected to said drive means and a second section connected to said retaining means for selectively retracting said second portion of said seat belt; and

means cooperating with said flexible means for converting said movement of said drive means in said rearward direction into a force whereby said second portion of said seat belt is retracted on said retaining means.

4,884,653

METHOD OF CONTROLLING A FOUR WHEEL DRIVE VEHICLE

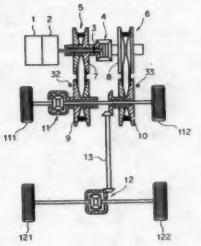
Katsumi Kouno, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 10, 1987, Ser. No. 83,847

Claims priority, application Japan, Aug. 8, 1986, 61-186495; Dec. 1, 1986, 61-286294

Int. Cl.[4] B60K *17/342*

U.S. Cl. 180—233 18 Claims



1. A controlling method of a four wheel drive vehicle having an engine and two front drive wheels and two rear drive wheels, the four wheel drive vehicle including an apparatus for controlling a distribution ratio of driving torque between the front wheels and the rear wheels, the apparatus including a differential gear mechanism, and first and second continuously variable transmissions, the differential gear mechanism receiving an output torque from the engine and distributing the output torque into two output torque lines connected to said two front drive wheels and said two rear drive wheels, respectively, the first continuously variable transmission being located in one of said two output torque lines and connected to the differential gear mechanism, the first continuously variable transmission transmitting a first amount of the output torque to a front driving shaft in said one output torque line, the second continuously variable transmission being located in the other of said two output torque lines and connected to the differential gear mechanism, the second continuously variable transmission transmitting a second amount of the output torque to a rear driving shaft in said other output torque line, said controlling method comprising the steps of:

detecting speeds of the front driving shaft and the rear driving shaft;

calculating an actual difference in speed between the detected speeds of said front and rear driving shafts;

detecting a driving condition of the vehicle which is substantially indicative of the load ratio of loads which act on the front wheels and the rear wheels; and

controlling an actual distribution ratio of driving torque between said front and rear drive wheels, so that said actual distribution ratio is substantially in proportion to said load ratio of the front and rear wheels, and such that the detected actual difference in speed between said front and rear driving shafts coincides with a desired value.

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TRANSMISSION CONTROL LOCKING DEVICE

Duilio Durigon, 61 Homestead Road, Rau Marais Park, Rau Marais Park Sandton, 2090, Transvaal, South Africa

Filed Aug. 21, 1987, Ser. No. 88,132

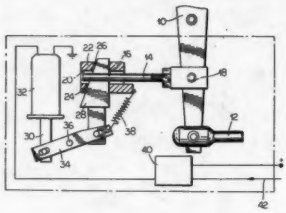
Claims priority, application South Africa, Aug. 22, 1986, 86/6372

Int. Cl.[4] B60R *25/00*

U.S. Cl. 180—287 8 Claims

1. A motor vehicle immobilizing device which is adapted to disable the drive train of the motor vehicle and which comprises remotely controllable locking means adapted releasably

to lock an actuator member constituted by a transmission gear selector lever in a predetermined position when the lever is moved to that position, the predetermined position of the lever coinciding with the position of a gear selection which disables the vehicle drive train by the disengagement of the transmission therefrom, the predetermined position of the selector lever coinciding with the "neutral" position of the transmission, the immobilizing device being adapted to disable the drive train of the vehicle by the provision of a gear selector lever with an enlarged heel in which is formed an aperture, the



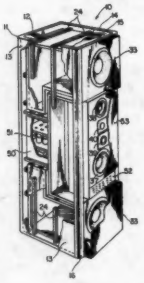
locking means including a solenoid with a spring loaded plunger which fits into the aperture in the enlarged heel, the solenoid being energisable by a remotely controlled electronic circuit which is adapted to retract the plunger against the urging of a spring to free the selector lever for normal operation and the plunger, with the solenoid de-energized, being adapted to bear against the enlarged heel of the operating lever under the force of the spring and to enter the aperture in the heel in the predetermined position of the lever, to prevent further movement of the lever.

4,884,655

TOWER-TYPE SPEAKER CABINET WITH PIVOTED PLURAL SPEAKER SUBASSEMBLY

Tommyca Freadman, Taipei, Taiwan, and John F. Castagna, Milford, Pa., assignors to Sparkomatic Corporation, Milford, Pa.

Filed Oct. 3, 1988, Ser. No. 260,410
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—145 **14 Claims**



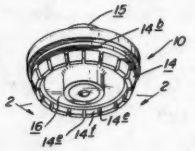
1. A tower-type speaker cabinet assembly for plural speakers of a high fidelity audio system, comprising a vertically elongated tower cabinet of generally rectangular horizontal cross-section having vertical side and rear walls spanning a height thereof and upper and lower front wall segments adjacent uppermost and lowermost ends of the tower speaker cabinet spaced apart vertically and lying in a vertical plane, wall means defining an intermediate forwardly opening cavity extending between the upper and lower front wall segments, a pair of vertically spaced large subwoofer speakers in the respective upper and lower front wall segments having cone portions peripherally mounted to said front wall segments, a swivelled movable center subcabinet vertically spanning the space between said front wall segments, a plurality of vertically spaced speaker units including a mid-range speaker and tweeters carried by a front wall portion of said center subcabinet, pivot means supporting said subcabinet for a predetermined range of swivel movement horizontally through predetermined angles about a vertical axis located a short distance rearwardly from the front wall of said swivelled subcabinet locating the front wall at one angular position thereof in said vertical plane of said front wall segments of the tower cabinet, sound box structure for each of the subwoofers, and means for minimizing vibration transfer between the subwoofer sound box structure and said tower cabinet.

4,884,656

SNAP-IN PLATE MOUNT

Ram J. Baheti; Dennis P. McGuire, and Kaya A. Kosar, all of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Continuation of Ser. No. 130,546, Dec. 9, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 274,704
Int. Cl.[4] F16F *15/00*
U.S. Cl. 181—207 **9 Claims**



1. In a plate mount useful in securing a member to a plate having a through bore in a manner permitting the member to vibrate relative to a plane of the plate, the mount having an outer rigid molded thermoplastic element adapted to be fastened to the plate around said bore, an inner element adapted to be fastened to the member, and an intermediate flexible molded elastomeric element extending between said inner and outer elements and mounting said inner element for motion relative to said outer element, the improvement wherein said outer element includes a wall having a pair of spaced shoulders for receiving the mounting plate and permitting relative movement in a transverse direction between the inner element and the outer element when installed, said wall having an end edge and a chamfered outer peripheral surface between said end edge and one of said shoulders, said wall having a plurality of peripherally spaced slots extending axially from said end edge for providing a series of discrete flexible wall portions that flex radially inward during insertion of the mount into the plate bore and radially outward upon installation, whereby the mount is fastened to the plate without any separate fasteners.

4,884,657

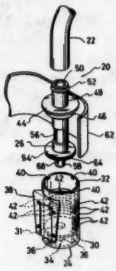
MUFFLER

Hiroshi Osada, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Feb. 16, 1989, Ser. No. 311,248
Claims priority, application Japan, Feb. 29, 1988, 63-26645[U]
Int. Cl.[4] F01N *1/10, 7/18*
U.S. Cl. 181—258 **20 Claims**

1. A muffler, comprising:
a cylindrical body;
a gas passage pipe disposed within said cylindrical body;
a sound absorber mounted upon said gas passage pipe such that gas discharged from said gas passage pipe passes through said cylindrical body and said sound absorber,

said cylindrical body having a disk-like partitioning wall axially dividing an interior portion thereof; and



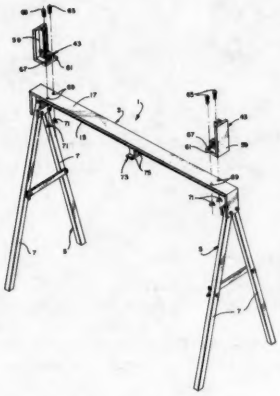
said gas passage pipe having an outer flange and a plurality of pawls for clamping said partitioning wall of said cylindrical body therebetween.

4,884,658

COLLAPSIBLE SAWHORSE

William A. Banfield, P.O. Box 13F, Ipava, Ill. 61441

Filed Oct. 24, 1988, Ser. No. 261,430
Int. Cl.[4] B27B *21/00*; B25H *1/06*; F41J *1/10*
U.S. Cl. 182—129 **15 Claims**



1. A collapsible sawhorse of the type including a crossbeam for supporting a load thereon and two pairs of legs pivotally connected at opposite ends of the crossbeam for disposition between a first load-supporting position and a second collapsed position, the improvement comprising:

(a) a stationary support block secured to the underside of the crossbeam at each end thereof;

(b) a support member connected to each support block for pivot movement relative to the support block by a first pivotal connection means;

(c) each pair of legs being connected to a support member by a second pivotal connection means;

(d) the first pivotal connection means permitting each support member and its corresponding pair of legs to collectively pivot inwardly about the first pivotal connection means toward the crossbeam, and the second pivotal connection means permitting the legs to be spread outwardly in the first position and folded together in parallel with each other in the second position;

(e) alignable passageway means formed through each support block and its corresponding support member, the passageway means being aligned and positioned below the underside of the crossbeam when the pairs of legs are disposed in the first load-supporting position; and

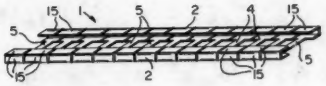
(f) locking means disposable in the aligned passageway means for maintaining each support member and its corresponding pair of legs in the first load-supporting position.

4,884,659

COLLAPSIBLE LADDER

Patrick Chao, 14307 Deer Ridge Drive, S.E., Calgary , Alberta, Canada T2J 5V9

Filed Nov. 30, 1988, Ser. No. 277,694
Int. Cl.[4] E04C *1/383*
U.S. Cl. 182—164 **6 Claims**



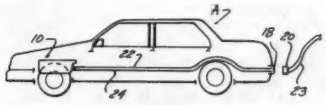
1. A collapsible ladder comprising a plurality of panel means pivotally interconnected in end-to-end relationship to form a compact body when folded into overlapping relationship with each other and to define an elongated body when unfolded so that the panel means are end- to-end in a plane, each said panel means including substantially rigid, central, transversely extending rung means and at least one side bar means on each end of said rung means pivotally connected to said rung means and to any subjacent or superjacent side bar means for rotation between a storage position in the same plane as said rung means and a use position perpendicular to said rung means; and spring means for biasing at least one and consequently all other said side bar means to the use position, whereby, when the said panel means are unfolded, the side bar means automatically rotate to the use position.

4,884,660

PROCESS FOR SIMPLE AND HIGH SPEED OIL CHANGE AND CRANK CASE FLUSHING IN AN INTERNAL COMBUSTION ENGINE

Ram Bedi, Birmingham, Mich., assignor to K.J. Manufacturing, Wixom, Mich.

Filed May 11, 1989, Ser. No. 350,303
Int. Cl.[4] F16C *3/14*
U.S. Cl. 184—1.5 **8 Claims**



1. A process for changing oil in an internal combustion engine having a crankcase, the crank case comprising movable componants and an pan with interior surfaces, the oil pan equipped with a through bore and an associated coupling member, the process comprising the steps of:

attaching an oil change conduit to the coupling member, said oil change conduit having at least one suction hose and at least one fill hose, said suction hose extending into the interior of the oil pan and said fill hose having a fill-spray assembly extending into the interior of the oil pan;

spraying a flushing fluid through said fill hose and said fill-spray assembly into the crank case interior under sufficient pressure to permit contact between said flushing

fluid and movable engine parts and the interior surfaces of the oil pan;

removing spent oil and said introduced flushing fluid present in the oil pan from the pan through said suction hose;

spraying additional flushing fluid into the crank case through said fill spray assembly;

removing said additional flushing fluid introduced into the oil pan through said suction hose;

spraying an amount of fresh motor oil appropriate for the vehicle into the crank case through said fill-spray assembly after removal of said flushing fluid, said fresh motor oil being sprayed at a pressure sufficient to permit contact between the fresh motor oil and said movable engine parts and said interior surfaces of the oil pan; and

removing said oil change conduit from the coupling member.

4,884,661

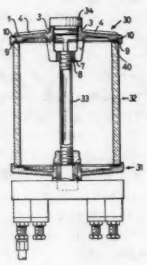
CENTER-FILL TOP COVER FOR OILERS

Ralph M. Hoffmann, 15950 N. Hillcrest Ct., Eden Prairie, Minn. 55346

Filed Jan. 23, 1989, Ser. No. 300,131

Int. Cl.[4] F16N *11/00, 19/00;* **B67C** *3/00;* **B65D** *51/16*

U.S. Cl. 184—88.1 **7 Claims**



1. A cover for a cylindrical receptacle for containing a fluid therein and having a securement extending axially through the center of said receptacle for securing said cover to said receptacle, said cover comprising:

a disc-shaped body having a first circular aperture in the center thereof;

a cap means detachably mounted about said first aperture for preventing a flow of fluid therethrough;

a plurality of arms extending axially downward from said body about the perimeter of said first aperture, said plurality of arms and said disc shaped body made as an integral assembly from a single piece of material, said plurality of arms spaced apart so as to create substantially open regions therebetween for allowing a flow of said fluid therethrough when filling said cylindrical receptacle; and

an annular body made from said single piece of material and integral with said plurality of arms, said annular body having a second circular aperture in the center thereof providing means for securing said cover to said securement.

4,884,662

DRIVER INTERACTION SERVICE CENTER AND METHOD OF OPERATING SUCH A CENTER

David Cho, and Richard M. Steckler, both of Los Angeles, Calif., assignors to Carousel Commons, Beverly Hills, Calif.

Filed Mar. 30, 1988, Ser. No. 175,106

Int. Cl.[4] E04H *3/04*

U.S. Cl. 186—36 **35 Claims**

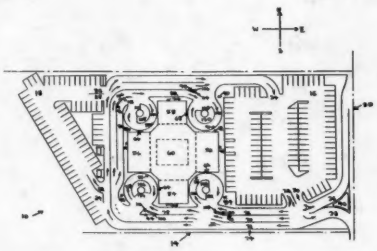
1. A driver interaction service center, comprising:

a driver service dispensing structure having a plurality of collection stations for dispensing services on a drive-thru basis to drivers of vehicles at the driver's side of said vehicles; and

a plurality of driveways for use by said vehicles, each of said driveways including an entrance portion and an exit portion, said driveways being arrayed so that each is adjacent to at least one of said collection stations and is directionally oriented for tandem collection of said services by said drivers of said vehicles at said driver's side of said vehicles, each of said driveways defining a circulatory drive-thru periphery that is situated along said driver's side of said vehicles with each driveway having a center of curvature situated nearer to the passenger's side of a given vehicle than to the driver's, each of said driveways being arranged for a circulatory traffic flow pattern between said entrance portion and said exit portion that is characterized by a cross-over traffic flow pattern upon completion of said circulatory pattern;

whereby each of said vehicles, after passing any one of said collection stations, completes said circulatory pattern by crossing over a portion of said driveway that it has previously traversed.

34. A method of operating a driver interaction service center, said service center including a plurality of interconnected driver service dispensing structures each having a collection station for dispensing services on a drive-thru basis to drivers



of vehicles at the driver's side of said vehicles, said method comprising the steps of:

causing said vehicles to follow a vehicular transit lane that at least partially surrounds said service dispensation structures;

selectively causing said vehicles to be diverted from said transit lane into one of a plurality of driveways sequentially arranged adjacent said transit lane and adjacent to at least one of said collection stations and each driveway defining a circulatory drive-thru periphery situated along the driver's side of said vehicles with each driveway having a center of curvature situated nearer to the passenger's side of a given vehicle than to the driver's side;

causing said diverted vehicles to move in a circulatory traffic flow pattern with the driver's side of said diverted vehicles situated along said drive-thru periphery of said driveway, thereby arriving at said collection station corresponding to one of said service dispensing structures positioned along said driveway with said driver's side of said vehicle adjacent to said collection station; and

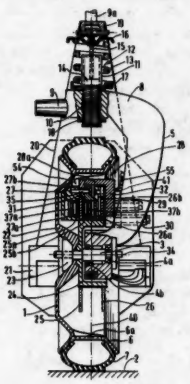
causing said diverted vehicles after passing said collection station to re-enter said transit lane, whereby each of said diverted vehicles is caused to complete said circulatory pattern through crossing over a portion of said driveway that it has previously traversed.

4,884,663

DEVICE FOR SUPPORTING AND ATTACHING A DISK BRAKE CALIPER

Daniel Trema, Bezons, France, assignor to Elf France, Courbevoie, France

Filed Aug. 4, 1988, Ser. No. 228,539
Claims priority, application France, Aug. 21, 1987, 87 11799
Int. Cl.[4] F16D *55/36;* B62L *1/00*
U.S. Cl. 188—18 A 8 Claims



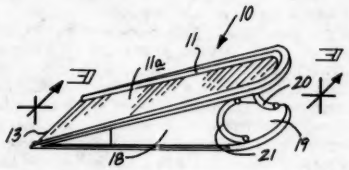
1. Device for supporting and attaching to non-rotating parts at least one brake caliper or yoke intended to cooperate with a brake disk, wherein said device comprises an attaching piece having a generally arcuate form, situated eyond the periphery of the disk and of which at least one part of the transverse section is U-shaped with two legs, one of which legs constitutes the section of a securing plate secured onto a member reacting to the braking torque, such as a single wheel suspension arm, while the other leg constitutes the section of at least one tab secured on either side to a brake caliper straddling a brake disk of which the mean plane substantially coincides with that of said at least one tab.

4,884,664

AUTOMOTIVE WEDGE GUIDE

Brian K. Berg, 8247 Doris St., San Gabriel, Calif. 91775

Filed Dec. 23, 1988, Ser. No. 289,261
Int. Cl.[4] B60T *3/00*
U.S. Cl. 188—32 1 Claim



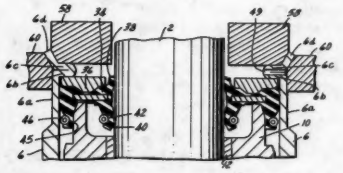
1. An automotive wedge guide comprising,
a top rigid surface angularly joined at a common forward junction line to a bottom rigid surface, and
a central portion defined between said top and bottom surfaces formed with a compressible material, and
a plurality of guide members secured to and extending outwardly of said central portion, and
wherein said top and bottom surfaces are planar and formed of relatively rigid material relative to said compressible central portion, and
wherein said top and bottom surfaces have laminated thereto respective top and bottom friction surfaces, and
wherein said respective top and bottom surfaces are formed with arcuate rear perimeters defining an arcuate rear central portion therebetween to provide a curvilinear guide surface, and
wherein said guide members comprise semi-circular rigid members positioned at a spacing on said central portion defining a diameter less than that of the spacing between said top and bottom rigid surfaces when said central portion is in a non-compressed configuration, and
wherein said top and bottom surfaces are angularly oriented relative to one another at substantially forty-five degrees.

4,884,665

AUTOMOTIVE SHOCK ABSORBER WITH UNITARY STRIKER PLATE AND CLOSURE CAP

William A. Parker, Manchester; Thomas E. Bartos, Woodhaven, and William M. Stewart, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1985, Ser. No. 816,584
Int. Cl.[4] F16F *9/36;* B23P *11/02;* F01B *11/02;* B65D *6/34*
U.S. Cl. 188—322.17 12 Claims



1. An automotive shock absorber comprising:
a working cylinder;
an outer cylinder mounted coaxially about said working cylinder;
a piston rod attached to a piston slidably carried within said working cylinder;
a rod guide engaged with said outer cylinder for locating said piston rod coaxially with said working and outer cylinders; and
a unitary closure cap for maintaining the engagement of said rod guide with said outer cylinder, said closure cap comprising an annular ring formed from a full thickness section of said outer cylinder and extending radially inwardly from the outer periphery of said outer cylinder, with said annular ring having a U-shaped cross section oriented such that the legs of said U-shaped section lie generally perpendicular to the axis of said outer cylinder with the bight of the U-shaped section defining the innermost radius of said annular ring.

4,884,666

TORSIONAL DAMPER AND MOUNTING ADAPTER

Carl R. Stahl, 3248 Fairbanks Cove, Memphis, Tenn. 38128

Filed Jan. 27, 1989, Ser. No. 302,360
Int. Cl.[4] B60K *17/22*
U.S. Cl. 188—378 15 Claims

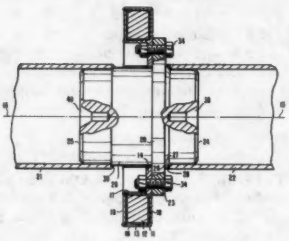
1. A torsional damper assembly for mounting between a first shaft and a second shaft to attenuate shaft vibration and noise comprising:
a housing having a ring shaped sealed cavity;
an annular inertia weight rotatably mounted in said cavity in unattached, concentric and slidable relationship therewith and defining a clearance therebetween;
bearing means retained between said housing and said inertia

weight and within said clearance to function as a medium to dampen shaft torsional vibration and noise;

bracket means attached to said housing and located radially inward of said cavity and said annular weight; and,

an adapter having a one piece main body which includes:

flange means directly attachable to said bracket means and to secure said adapter to said housing and limit motion therebetween;



first mounting means integral with said flange means and directly engageable with said first shaft to fixedly secure said adapter to said first shaft to limit longitudinal and lateral motion therebetween; and,

second mounting means integral with said flange means and directly engageable with said second shaft to fixedly secure said adapter to said second shaft to limit longitudinal and lateral motion therebetween.

4,884,667

AUTOMATIC CHANGE GEAR CONTROL MEANS

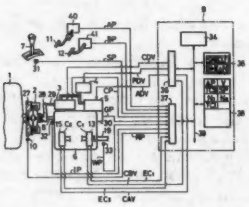
Hidetaka Koga, Ebina, Japan, assignor to Isuzu Motors Ltd., Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 222,535

Claims priority, application Japan, Jul. 22, 1987, 62-181158; Jul. 22, 1987, 62-181159

Int. Cl.[4] B60K *20/16*

U.S. Cl. 192—3.55 **34 Claims**



1. An automatic change gear control means, comprising:

gear-shift means including a plurality of speed ranges which comprise a plurality of gear trains having a different number of teeth, said plurality trains being provided between an input shaft connected to a drive shaft of an engine through a clutch and an output shaft dispose din parallel with said input shaft in such a manner as to face each other, said gear-shift means being adapted to change speed ranges to any one of said plurality of sped ranges consisting o ranges between a highest speed range and a lowest speed range so that torque is transmitted from said input shaft to said output shaft in said speed range by selecting the engagement of any one of said plurality of gear trains;

a first transmitting torque varying means adapted to start and end transmission of torque between said input shaft and said output shaft at a gear train for the highest speed range, and to vary the amount of torque transmitted;

a second transmitting torque varying means adapted to start and end transmission of torque between said input shaft and said output shaft at a gear train for the lowest speed range, and to vary the amount of torque transmitted; and

control means for, when gears are to be shifted, actuating said first transmitting toque varying means for synchronization, disengaging the gear train for said selected speed range, when gears are to be shifted up from a lower speed range to a higher speed range, actuating said first transmitting torque varying means so as to synchronize an engine speed to that of a subsequent speed range, and then shifting speed ranges, and when gears are to be shifted down from a higher speed range to a lower speed range, actuating said second transmitting torque varying means so as to synchronize an engine speed to that of a subsequent speed range, and then shifting speed ranges.

4,884,668

AUTOMATIC TRANSMISSION SHIFT CONTROL DEVICE

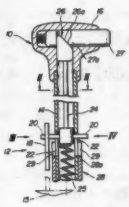
Satoshi Kobayashi, Hiratsuka, and Koji Kato, Kosai, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama; Nissan Shatai Company, Limited, Hiratsuka; Ohi Seisakusho Co., Ltd., Yokohama and Fuji Kiko Co., Ltd., Tokyo, all of, Japan

Filed Jul. 1, 1988, Ser. No. 214,068

Claims priority, application Japan, Jul. 5, 1987, 62-167468

Int. Cl.[4] B60K *41/28*

U.S. Cl. 192—4 A **9 Claims**



1. An automatic transmission shift control device for a vehicle having a brake pedal, comprising:

a selector lever movable into a plurality of gear positions including a parking position and having a hollow cylindrical post having a pair of diametrically opposed openings and a knob attached to an upper end of said post; and

means for controlling movement of said selector lever;

said means including a position plate having a profiled opening defining said gear positions, a position pin installed transversely of said post in said openings for up-and-down movement and releasably engaged in said position plate for positioning said selector lever at one of said gear positions, a rod installed in said post for up-and-down movement and supporting said position pin at the lower end thereof, a control button mounted in said knob for substantially horizontal movement and cooperative with said rod to disengage said position pin from said position plate, a bushing mounted on said post for rotation but against axial movement and having at the upper end a pair diametrically opposed notches with which said position pin is engaged for disengaging said position pin from said position plate, a solenoid operatively connected to said bushing to rotate same selectively between a first position where said notches are aligned with position pin and a second position where said notches are misaligned with said position pin, and an electrical circuit for controlling said solenoid in such a way that said bushing is rotated into said first position when said position pin is at said parking position and the brake pedal is fully depressed and

into said second position when said position pin is at said parking position and the brake pedal is free from depression.

4,884,669

MOTOR-VEHICLE ANTIRUNAWAY SYSTEM

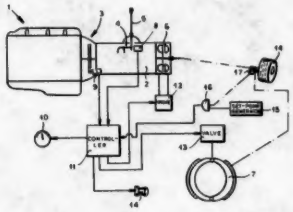
Friedrich Ehrlinger, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 15, 1988, Ser. No. 232,605

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727088

Int. Cl.[4] B60K *31/00*

U.S. Cl. 192—4 B **5 Claims**



1. In a motor vehicle having:
an engine;
a transmission displaceable between a neutral position and a plurality of different speed positions;
an engageable and disengageable clutch connected between the transmission and the engine; and
a brake for slowing the vehicle, an antirunaway system comprising:
clutch sensor means for generating an output when the clutch is engaged;
transmission sensor means for generating an output when the transmission is in the neutral position;
speed sensor means for determining the vehicle ground speed; and
control means connected to all of the sensor means and to the brake for actuating the brake and slowing the vehicle when both the outputs are being generated and when the ground speed determined by the speed sensor means exceeds a predetermined limit.

4,884,670

VARIABLE COMPLIANCE DEVICE

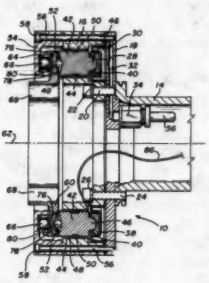
Peter E. McCormick, Dallas; Timothy D. Culbertson, Little Elm, and Walter D. Autry, Jr., Keene, all of Tex., assignors to EOA Systems, Inc., Dallas, Tex.

Filed Mar. 15, 1988, Ser. No. 168,489

Int. Cl.[4] F16D *7/02*

U.S. Cl. 192—56 F **16 Claims**

1. A variable compliance device comprising:
a tool plate for attachment to a tool;
housing means for coupling the tool plate to a robot arm to allow limited longitudinal, lateral, and rotational movement of the tool plate relative to the robot arm;
the tool plate and the housing means defining a central, axially extending passageway;
bearings between said housing means and said tool plate to facilitate lateral and rotational movement of the tool plate relative to the housing means;
a plurality of concave ball seats mounted on the tool plate and positioned at circumferentially spaced points around the central, axially extending passageway;
a plurality of balls each recessed in one of the ball seats of the tool plate;
a plurality of pins each slidably mounted on the housing means and each having a concave surface for operative engagement one of the balls in the concave ball seats so that longitudinal, lateral, or rotational movement of the tool plate relative to the robot arm caused by an outside force causes the pins to move relative to the housing means; and



pnuematic bias means associated with the pins for exerting a force against the pins towards the concave ball seat to resist movement of the tool plate relative to the housing means and to restore the tool plate to its original position relative to the housing means after the outside force is removed.

4,884,671

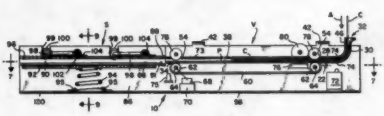
PAPER CURRENCY ACCEPTOR AND METHOD OF HANDLING PAPER CURRENCY FOR VENDING MACHINES AND THE LIKE

Vedasto Gardellini, 23 Sheldon Pl., Commack, N.Y. 11725

Continuation of Ser. No. 812,365, Dec. 23, 1985, abandoned. This application Nov. 14, 1988, Ser. No. 273,176

Int. Cl.[4] B07C *5/00*

U.S. Cl. 194—207 **7 Claims**



1. In a paper currency acceptor for vending machines and the like comprising a housing having inlet for the receipt of a sequency of paper currency bills fed individually thereto, means for sensing the insertion of each bill fed to said inlet a verification station and a storage station axially arranged at the end thereof, said verification station having a passageway defined by a pair of relatively spaced planar members between which successive bills may be longitudinally moved and restrained, said passageway having one end aligned with said inlet and its other end aligned with said storage station and having means adjacent each end for determining that the bill inserted therein is of the proper length and for rejecting through said inlet, faulty bills, and conveyor means located within said verification station responsive to the means for sensing the insertion of the successive bill into said inlet for automatically indexing the retained stepwise through said passageway and verification station and subsequently longitudinally ejecting said bills successively to said storage station, said storage station comprising a pair of spaced parallel guide rails defining on one surface a guide path coaxially extending from and co-planarly aligned with said passageway for slideably receiving and supporting said bills along the edges of said bills parallel to the direction of movement as said bills are

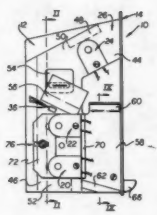
successively indexed from said verification station, and a moveable platform lying in a plane parallel to and offset from said guide path spanning the paired guide rails opposite said guide path and spring means resiliently biasing said platform to normally press against said guide rails on the surface opposite said guide path, and displacement means offset from said guide path and in alignment with the space between the guide rails, said displacement means being operable, on movement of a bill into alignment therewith and in response to the introduction of the succeeding bill into said inlet to reciprocably extend into and retract from said space between said guide rails to translate said aligned bill from said guide path onto said platform such that said guide path is left vacant to receive a succeedingly indexed bill said platform cooperating with said displacement means to permit the edge of successively translated bills to fall between said guide rails and said platform on extension of said displacement means to create a bundle of bills stacked one on top of the other said stack being resiliently compressed between said platform and the opposite surface of said rails, on retraction of said displacement means, including detecting means operable at said verification station for determining the authenticity and value of the paper currency indexed thereto, said conveyor means being operable in response to a determination that each bill of said paper currency is authentic to permit the bill to be subsequently indexed along said passageway and guide path to said storage position on the insertion of another bill, and in response to a determination that the bill is not authentic to operate said conveyor means prior to the insertion of any subsequent bill to move the bill in an opposite direction to return and reject it through said inlet.

4,884,672

COIN ANALYZER SYSTEM AND APPARATUS

Donald O. Parker, Grand Rapids, Mich., assignor to Parker Engineering & Manufacturing Co., Grand Rapids, Mich.

Filed Aug. 12, 1988, Ser. No. 231,697
Int. Cl.[4] G07D *5/08*; G07F *3/02*
U.S. Cl. 194—318 **40 Claims**



32. A coin acceptor device, comprising:

a support frame;

a coin acceptance channel mounted on said support frame, said coin acceptance channel having a test region thereon;

a tested coin sensor located at said test region and having a tested coin output;

a first sample coin mount on said support frame and adapted to selectively secure a first sample coin;

a first sample coin sensor disposed at said first sample coin mount and having a first sample output;

a second sample coin mount on said support frame and adapted to selectively secure a second sample coin;

a second sample coin sensor disposed at said second sample coin mount and having a second sample output;

means for comparing said tested coin output with said first and second sample outputs and for determining whether said tested output is substantially the same as one of said first and second sample outputs; and

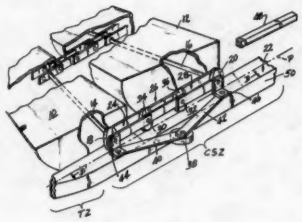
said first and second sample coin mount disposed adjacent each other, and said first and second sample coin mount including an adjustable mounting clamp bracket selectively slidably coupled with said frame and having at least two sample coin seats thereon configured to selectively releasably clamp said sample coins at said sample coin sensors.

4,884,673

CURVED ESCALATOR WITH FIXED CENTER CONSTANT RADIUS PATH OF TRAVEL

James A. Rivera, Bristol, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Mar. 27, 1989, Ser. No. 328,934
Int. Cl.[4] B66B *21/02*
U.S. Cl. 198—328 **7 Claims**



1. An escalator assembly having an arcuate path of travel defined by a constant radius derived from a fixed center as viewed in plan, the escalator including horizontal entry and exit landing zones, an intermediate constant slope zone, and entry and exit transition zones of continuously varying slope interconnecting the constant slope zone with the entry and exit landing zones respectively, said escalator assembly including:

(a) track means extending between said landing zones and through said transition and constant slope zones for guiding movement of steps along the path of travel of the escalator;

(b) a plurality of steps, each having: an upper tread portion which remains substantially horizontal throughout a passenger transporting portion of the path of travel of the escalator; a step axle at radially inner and outer sides of each step; radially inner and outer step axle rollers rotatably mounted on said step axles, said step axle rollers being operable to travel over radially inner and outer portions of said track means;

(c) radially inner and outer step chains forming a continuous connection between said step axles whereby all of said steps are connected together at both their inner and outer sides throughout the entire path of travel of the escalator; and

(d) camming means for continuously changing the effective length of the outer one of said step chains as the steps move through each of said transition zones so as to move the step axles of adjacent steps toward and away from each other by sliding selected links on said outer step chain toward and away from each other while retaining all of the links in the outer step chain in substantially linear alignment with each other said camming means being operably connected to successive pairs of said outer step axles; and said selected links being adjacent links interposed between each of said successive pairs of said outer step axles, said camming means being operable to move said outer step axles in each successive pair thereof closer together, as said steps move through said entry transition zone, by sliding said selected links toward each other; said camming means further being operable to hold said outer step axles in each successive pair thereof closer together as said steps move through said constant slope zone; and said camming means being operable to move said outer step axles in each successive pair thereof further apart in said exit transition zone by sliding said selected links away

from each other, said camming means being operable to hold said outer step axles in each successive pair thereof further apart in each of said entry and exit landing zones and said camming means comprising a cam roller operably connected to each outer step axle in each successive pair thereof; and a profiled cam path which said cam roller follows whereby said cam roller causes relative convergent and divergent movement of said outer step axles at different points on said cam path.

4,884,674

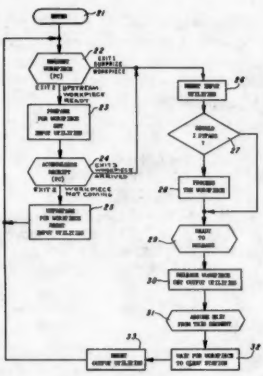
SEGMENTED ASYNCHRONOUS OPERATION OF AN AUTOMATED ASSEMBLY LINE

Claude D. Head, III, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 599,211, Apr. 12, 1984, abandoned, which is a continuation of Ser. No. 269,306, Jun. 1, 1981, abandoned, which is a division of Ser. No. 134,387, Apr. 16, 1971, Pat. No. 4,306,292. This application Jan. 30, 1985, Ser. No. 696,876

Int. Cl.[4] B65G *43/00*

U.S. Cl. 198—341 **9 Claims**



1. A method for transferring a workpiece within an asynchronously operating assembly line provided with at least first and second work stations comprising the steps of:

(a) indicating at said first work station that said workpiece is ready for transfer from said first work station to said second work station;

(b) indicating when said second work station is prepared to receive said workpiece;

(c) assuring said workpiece exits from said first work station responsive to said indications in steps (a) and (b);

(d) preparing said first work station to receive another workpiece after assuring said workpiece exits from said first work station; and

(e) repeating steps (a) through (d).

4,884,675

LINKING PROCESS AND LINKING DEVICE BETWEEN A FABRICATION MACHINE FOR ENVELOPES AND A CONDITIONING MACHINE

Pierre Muraro, Peage de Roussillon, and Daniel Pernot, Saint-Clair, both of France, assignors to Garnier Ponsonnet - Vuillard S.A., Davezieux, Annonay, France

Filed Jul. 6, 1987, Ser. No. 69,979

Claims priority, application France, Jul. 7, 1986, 86 09847

Int. Cl.[4] B65G *47/10*

U.S. Cl. 198—358 **10 Claims**

1. A linking device for automatically grouping envelope-type products into lots and for transporting the lots from a grouping station to a second location, comprising:

the grouping station;

a working table;

a cylindrical shaft extending upward from the working table and mounted thereto;

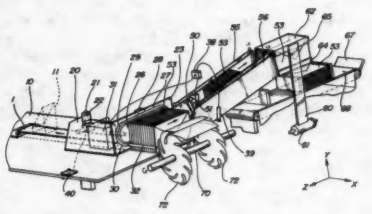
a pivoting plate rotatably mounted to the cylindrical shaft and substantially parallel to the working table, such that said pivoting plate is free of contact from said working table;

a first belt transporter;

a second belt transporter;

transfer means for transferring the lots of envelope-type products from the grouping station to the first belt transporter, comprising a mobile bar for pushing the lots sideways from the grouping station to the first belt transporter, a drive motor, a chain connected to an end of the mobile bar for transferring the motion of the drive motor to the mobile bar, and two pignons for controlling the path of motion of the chain; and

short-circuiting means comprising the pivoting plate for pivotingly shifting the grouping station away from the transfer means upon occurrence of an incident in order to permit manual discharge of the lots of envelope-type products;



the grouping station supported by the pivoting plate and comprising a support plate perpendicular to the pivoting plate and means for orienting and grouping the envelope-type products into lots;

the means for orienting and grouping comprising a selection finger for grouping the envelope-type products into lots before transfer to the first belt transporter and a compensator buffer mounted on a side of the support plate and facing the lots for maintaining the lots in a position perpendicular to the pivoting plate before and during transfer;

the drive motor, chain, and pignons of the transfer means being mounted on a side of the support plate opposite the compensator buffer;

the grouping station further comprising a counter for the envelope-type products which is electronically linked to both the selection finger and the drive motor;

the first belt transporter comprising means for transferring the lots of envelope-type products to the second belt transporter;

the second belt transporter having studs for maintaining separation between the lots and comprising means for transferring the lots of envelope-type products from the first belt transporter to the second location.

4,884,676

TRANSFERRING AND SORTING APPARATUS

Dairi Suizu, Hyogo, Japan, assignor to Okura Yusoki Kabushiki Kaisha, Hyogo, Japan

Filed Jul. 25, 1988, Ser. No. 223,959

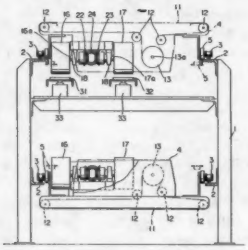
Claims priority, application Japan, Aug. 5, 1987, 62-195737

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—365 **2 Claims**

1. A transferring and sorting apparatus comprising a transfer

body moving along a transfer passage, an endless sorting belt which is capable of running in a direction crossing a direction of movement of the transfer body, a driving pulley for driving the sorting belt, friction wheels provided below the transfer body and connected via transmission means to the driving pulley, and a pair of friction members provided in predetermined positions on the transfer passage and adapted to be moved toward and away from the friction wheels, wherein one



of the two friction members is moved selectively toward the friction wheels to engage the former with one of the latter, and the turning movement of the friction wheel rolled with respect to the friction member is transmitted to the driving pulley via the transmission means, so that the driving pulley is turned selectively in the forward or reverse direction depending on the friction member selected to drive the sorting belt selectively toward one side portion of the transfer passage or the other side portion thereof.

4,884,677

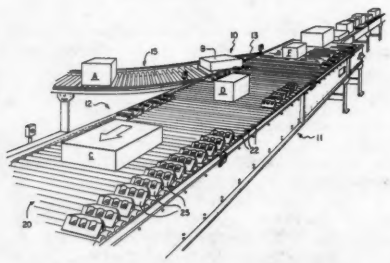
PACKAGE SORTATION CONVEYOR

Thomas C. Yu; Robert K. Vogt, and John J. Wilkins, all of Cincinnati, Ohio, assignors to The Buschman Company, Cincinnati, Ohio

Continuation of Ser. No. 64,430, Jun. 22, 1987, abandoned, which is a division of Ser. No. 878,734, Jun. 26, 1986, Pat. No. 4,711,341, which is a continuation of Ser. No. 675,156, Nov. 27, 1984, abandoned. This application Feb. 16, 1988, Ser. No. 159,476

Int. Cl.[4] B65G *47/46*

U.S. Cl. 198—370 **6 Claims**



1. In a package conveyor system including a main line and a plurality of branch outlets leading from a side of said main line and comprising a frame defining said main line and branch outlets, an endless apron supported for movement on said frame, said apron comprising a pair of endless chains and a plurality of cross members connected at opposite ends thereof to said chains in spaced relation with each other lengthwise of said apron whereby the uppermost portion of said cross members define a discontinuous apron surface in a horizontal plane on which packages are supported, and means for driving said apron to convey packages supported thereon along said main line from the upstream end thereof, the combination of

(a) a plurality of pusher elements each mounted on at least one of said cross members for movement laterally of said apron as well as forward movement with said cross member,

(b) each said pusher element having a side face extending upwardly above said plane of said discontinuous surface for engagement with the side of a package on said apron upon movement of said pusher element on said cross member laterally of said apron,

(c) means in said frame for causing each said pusher element to enter the upstream end of said main line adjacent one side thereof,

(d) means in said frame for causing preselected numbers of said pusher elements to move laterally of said apron in sequence to push a laterally adjacent package across said apron surface toward a selected one of said branch outlets,

(e) each said pusher element also having an individual leading face extending downwardly and forwardly with respect to said face thereon from a level substantially above said plane of said discontinuous surface to a level below said surface,

(f) whereby upon engagement of a said leading face with a package held against forward movement on said apron surface with respect to said frame, the pusher element will lift such held package with respect to said apron and pass under the lifted package.

4,884,678

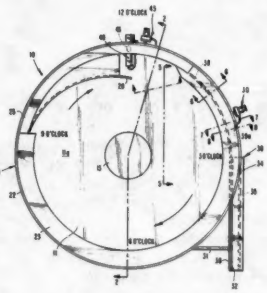
ORBITAL CAP SELECTING AND FEEDING MECHANISM

S. Neal Graham, 365 Beechwood Dr., Noblesville, Ind. 46060, and Thomas E. Terry, R.R. 2, Box 92, Atlanta, Ind. 46031

Filed Sep. 28, 1987, Ser. No. 101,853

Int. Cl.[4] B65G *29/00*

U.S. Cl. 198—392 **5 Claims**



2. An apparatus for sorting hollow open-ended caps, comprising:

an inclined disk rotatable about its normal axis and having a peripheral portion onto which open-ended caps disposed on said disk move by operation of centrifugal force during rotation of said disk;

means for detecting the orientation of the open-ended caps on said peripheral portion near the highest point of said inclined disk during rotation of said disk, and for sorting based on the orientation of the open end of the caps; and

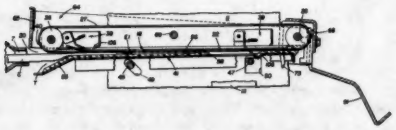
a discharge chute tangentially intersecting said peripheral portion approximately 90° downstream of said sorting means in the direction of rotation of said disk for receiving sorted open-ended caps.

4,884,679

SECURE TRANSPORT CONSTRUCTION FOR BANKING DEPOSITORY DEVICES

Harry T. Graef, Massillon, and Kevin H. Newton, North Canton, both of Ohio, assignors to Diebold Incorporated, North Canton, Ohio

Filed Apr. 5, 1984, Ser. No. 597,230
Int. Cl.[4] B65G *19/00*
U.S. Cl. 198—718 19 Claims



1. A transport mechanism having entry and discharge ends for transporting envelopes containing banking materials deposited into deposit accepting banking equipment under secure conditions, the mechanism transporting a deposited envelope from the entry end to the discharge end, said mechanism comprising:

a frame;

a fixed platen mounted on said frame;

spaced rolls journaled in fixed positions on said fixed platen;

driving means for driving one of said rolls;

an endless belt trained around the spaced rolls, said belt having a first belt flight movable and in supporting contact with said fixed platen;

a movable platen extending from the entry end to the discharge end;

mounting means for mounting the movable platen on said frame, said mounting means permitting movement of the entire movable platen angularly away from the fixed platen and in the direction of travel of the first belt flight when the belt is driven; and

biasing means biasing the movable platen toward the fixed platen to engage the first belt flight;

the deposited envelope engaging the belt at the entry end and being conveyed by the first belt flight between the fixed and movable platens, the deposited envelope moving the movable platen away from the fixed platen to the degree necessary to accommodate the thickness of said envelope.

4,884,680

COSMETIC DISPLAY

Gary Israel, West Nyack; Wayne Steenod, Monroe, and Richard C. O'Mara, Westtown, all of N.Y., assignors to Avon Products, Inc., New York, N.Y.

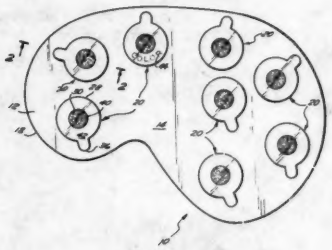
Continuation of Ser. No. 14,970, Feb. 17, 1987. This application Jul. 15, 1988, Ser. No. 220,930
Int. Cl.[4] B65D *23/12*
U.S. Cl. 206—44.11 1 Claim

1. A display for cosmetic material comprising:

a substantially flat base member;

a multiplicity of individual color display sections mounted on said base member in spaced relation to each other, each of said display sections being of smaller extent than said base member and being substantially flat to form a flexible laminate when disposed on said base member, each of said display sections having an opening therein and a transparent member co-extensively overlying at least said opening therein,

a predetermined quantity of cosmetic material disposed in each of said openings between said transparent member and said base member, said predetermined quantity of cosmetic material comprising enough material to provide at least one normal application to a consumer, said transparent member being removable to permit access to said cosmetic material, and



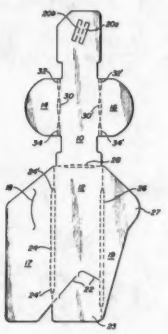
wherein said base member is in the shape of an artist's palette and said cosmetic material reposing in said openings in said display sections simulate the colors of an atrist's palette.

4,884,681

RETAINER FOR SURGICAL SUTURES

Constance E. Roshdy, North Brunswick, N.J.; Robert J. Cerwin, Pipersville, Pa., and Marvin Alpern, Glen Ridge, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Oct. 28, 1988, Ser. No. 264,292
Int. Cl.[4] A61L *15/00*
U.S. Cl. 206—63.3 6 Claims



1. An improved retainer for surgical sutures which encloses a surgical suture, and including a compartment in which said suture is retained, comprising:

a first panel having a longitudinal edge; and

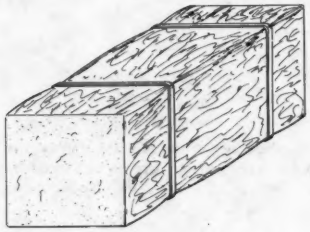
a second panel foldably connected to said longitudinal edge of said first panel, the foldable connection of said second panel to said edge of said first panel including, at each end of said foldable connection, a gusset comprising two transversely separated score lines extending inwardly from said end and terminating in a single score line, and said foldable connection further comprising an additional gusset located between said end gussets, said additional gusset comprising two transversely separated score lines terminating in a single score line at each end of said additional gusset.

4,884,682

SYSTEM FOR BALING STRANDS OF MATERIAL AND A DENSER BALE OF STRANDS OF MATERIAL SO PRODUCED

Donald E. Weder, and Erin H. Weder, both of Highland, Ill., assignors to Highland Manufacturing and Sales Company, Highland, Ill.

Filed Apr. 30, 1984, Ser. No. 605,386
Int. Cl.[4] B65D *71/00*
U.S. Cl. 206—83.5 8 Claims



1. A bale of Easter grass strands of material produced by compressing the Easter grass strands of material in a pressing container, comprising:

a bale of Easter grass strands of material having a density of at least 14 pounds per cubic foot and having substantial portion of the baled Easter grass strands of material unmatted, each strand having a length and a generally rectangularly shaped cross section; and

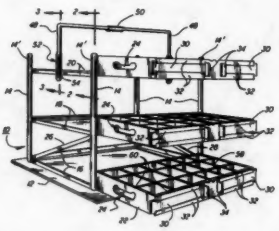
means for removably securing the bale of Easter grass strands of material in a bale.

4,884,683

BOTTLE CARRIER

Thomas E. Ford, Cederwood Blvd., D-59, Baldwinsville, N.Y. 13027

Filed Apr. 12, 1989, Ser. No. 336,798
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—163 9 Claims



1. A bottle tote for temporary storage and transport of empty containers comprising, in combination:

(a) a flat rectangular base, of predetermined length and width;

(b) two front and two rear, upright members, each fixedly attached at one end to said base at spaced points thereon defining a rectangle of lesser length and width than said predetermined length and width, and extnding perpendicularly from said base to free ends lying in a common plane parallel to said base;

(c) at least two track structures fixedly supported upon said upright members at different distances from and parallel to said base, each of said track structures including members extending between said front and rear upright members on each side and between said two rear upright members with the space between said front upright members unobstructed;

(d) at least two trays, each having front, rear, side and bottom walls and an open top, said trays having a length and width dimensioned to fit between said upright members and removably rest upon said track structures by insertion and removal through said unobstructed space between said front upright members; and

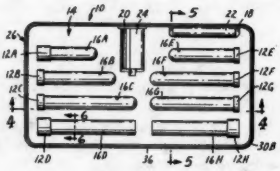
(e) a handle structure affixed to the uppermost of said track structures for lifting and carrying said tote.

4,884,684

CONTAINMENT DEVICE FOR BIOLOGICAL MATERIALS

Rodney A. Bernardin, Stillwater; Laurel A. Hanken, St. Paul; Thomas I. Insley, Lake Elmo, and Alice C. Murray, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 6, 1988, Ser. No. 190,991
Int. Cl.[4] B65D *81/26, 81/02*
U.S. Cl. 206—204 21 Claims



1. A containment device for sealing and protecting containers of hazardous or biological materials comprising a resilient energy-absorbent cushion of aqueous fluid sorbent material that retains its ability to sorb fluid after responding to impact, the cushion having a plurality of openings, each opening being adapted for receiving a respective container of hazardous or biological material, the openings being arranged such that each opening is surrounded by sufficient sorbent material to sorb leakage of material from its respective container if the container and/or if any additional containers break and to resiliently absorb impact energy when the device is impacted, with the material resiliently returning to its original configuration after impact, and a case of aqueous fluid resistant material for receiving and enveloping the fluid sorbent material, the case including two generally stiff-flexible portions having parts adapted for complementary interengagement and adapted to receive means for sealing the portions together to form an air and fluid tight package.

4,884,685

DEVICE FOR STORING FLAT RECORDING MEDIA

Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Chur, Switzerland

Division of Ser. No. 92,434, Sep. 3, 1987, Pat. No. 4,804,085, which is a continuation of Ser. No. 852,458, Apr. 1, 1986, abandoned. This application Feb. 7, 1989, Ser. No. 307,425
The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.
Int. Cl.[4] B65D *85/57, 85/672*
U.S. Cl. 206—309 15 Claims

1. A device for storing flat recording media comprising:

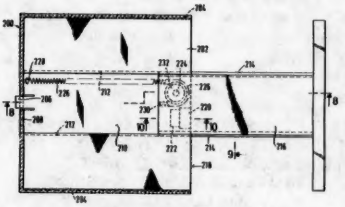
a housing having a top wall, side walls, a rear wall and an open front;

at least one plate member disposed in said housing opposite said top wall, said plate member cooperating with said housing walls to define at least one compartment in said housing, said plate member including guide rails positioned in said compartment;

a slider member in each said compartment, each said slider

member having a bottom which defines a recording media support surface, said slider members cooperating with plate member guide rails whereby said slider members are moveable through said housing open front between an inserted position where a recording media supported on said support surface is located in a said compartment and an ejected position in which recording media can easily be removed from the slider member;

a spring in each said compartment for biasing the slider member in the compartment toward its ejected position,



each said spring assuming an extended configuration when its associated slider member is in the inserted position, a tensioned bias-producing portion of each said spring being positioned between a said support surface and a said plate member when in said extended configuration, said spring members pulling said slider members from the inserted toward the ejected position of the slider members; and

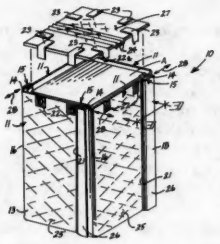
manually releasable locking means for holding each slider member in its inserted position against the bias of an associated said spring.

4,884,686

ADJUSTABLE APPLIANCE COVERING

John R. Dupuis, 20330 Pinecrest, Taylor, Mich. 48180

Filed Dec. 5, 1988, Ser. No. 279,548
Int. Cl.[4] B61D *85/00*
U.S. Cl. 206—320 **4 Claims**



1. An adjustable appliance covering comprising,

a plurality of engagement members wherein each engagement member includes a central planar portion, and

a first side portion, and a second portion, each of the first side portions are adjustable securable to the central planar portions, and

an interior defined by each of the second side portions securably and adjustably received at a first side portion therewithin of an adjacent engagement member, and

the inter-securing engagement members define a parallelepiped, and

a top portion is securable to overlying top edges of said engagement members when said engagement members are securably connected to each other, and

said top portion further includes a plurality of fastening means fixedly secured to said top portion and securable to companion fastening means on said engagement member to enhance rigidity of the appliance covering, and

wherein each first side portion defines an end flap hingedly securable to said central planar portion, and each second side portion includes a bifurcated end portion including an interior flap rigidly secured to said central planar portion with an exterior flap hingedly secured to said central planar portion, and

wherein each interior surface of said interior and exterior flaps includes hook and loop connectors selectively securable to second hook and loop connectors formed on interior and exterior surfaces of each end flap, and

wherein said top portion includes a medially formed accordion hinge to enable expansion of said top portion to accommodate adjustment of said engagement members, and

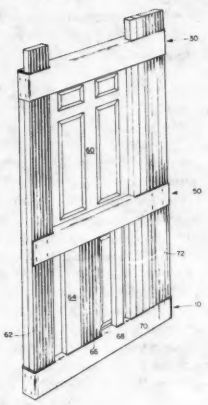
wherein the fastening means of said top portion includes a plurality of flexible strips fixedly secured to said top portion at one end thereof and formed with hook and loop fasteners at other ends thereof cooperative with hook and loop connector portions formed adjacent upper edge portions of each respective engagement member.

4,884,687

DOOR UNIT INSTALLATION KIT WITH PACKAGING AND DISPLAY CONTAINER

Marshall T. Steves, San Antonio, Tex., assignor to Steves & Sons, Inc., San Antonio, Tex.

Filed May 7, 1987, Ser. No. 47,623
Int. Cl.[4] B65D *85/64*
U.S. Cl. 206—321 **6 Claims**



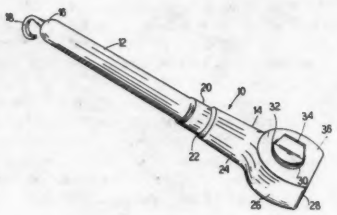
1. A container for a packaged door unit that includes a standard size door and jambs, which are at least as tall as said door, comprising:

a bottom piece, made of foldable sheet material, said bottom piece being of sufficient dimensions so that it may be folded up to envelop a bottom end of said door, said bottom piece having a front edge, back edge, and two side edges wherein said side edges each have a precut tab, said bottom piece having a bottom spacer flap extending from said front edge, said bottom spacer flap being foldable to form an L-shaped spacer that may be inserted between said door and said bottom piece, said spacer having cut-out portions that are of sufficient size to allow said door jambs to be inserted therein in an upright position;

a top piece, made of foldable sheet material, said top piece being of sufficient dimensions so that it may be folded to envelop a top end of said door, said top piece having a

front edge, back edge, and two side edges, wherein said side edges each have a precut tab.

4,884,688
TOOTH BRUSH CASE
Joseph S. Hurst, 809 S. Damen Ave., Chicago, Ill. 60612
Filed Apr. 11, 1988, Ser. No. 179,659
Int. Cl.[4] B65D *81/22*; A46B *17/06*
U.S. Cl. 206—362.2 **6 Claims**

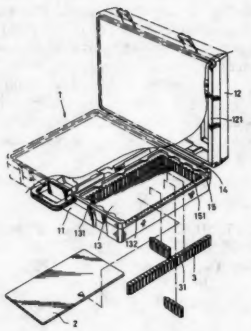


1. A tooth brush case for holding a tooth brush and a liquid, comprising:
a hollow elongated handle so dimensioned as to extend over a handle portion of a tooth brush, said handle having means for engaging the tooth brush handle portion in snug engagement;
a free-standing liquid-tight reservoir able to hold a liquid when in a free-standing position and so dimensioned as to selectively enclose a bristle portion of the tooth brush when said reservoir is fastened to said handle;
means for selectively fastening said handle to said reservoir in liquid-tight engagement to provide a liquid-tight closed case;
a selectively openable filling opening in a front surface of said reservoir; and
means for selectively sealing said filling opening in liquid-tight engagement.

4. A case for a tooth brush and a liquid, comprising:
a handle means having a wall portion defining an interior space for receiving a handle of a tooth brush, the interior surface of said wall portion having engaging means for secure frictional engagement with the handle of the tooth-brush, said handle means having a first open end with a first fastening portion and a second opposite end that is closed in a liquid tight fashion when the handle of the tooth brush is received in said handle means;
a reservoir means having a liquid-tight reservoir wall portion defining a reservoir interior space for receiving a brush portion of the tooth brush engaged in said handle means when said handle means is fastened to said reservoir means, said reservoir wall portion including an opening into said reservoir interior space, said reservoir wall portion having a second fastening portion about said opening, said second fastening portion being connectable in liquid-tight engagement with said first fastening portion of said handle means, said reservoir wall portion including at least one surface with a filler opening into said reservoir interior space; and
a selectively closeable cap connectable in a liquid-tight engagement in said filler opening in said surface.

6. A case for a tooth brush and a liquid, comprising:
a handle means having a wall portion defining an interior space for receiving a handle of a tooth brush, said wall portion including engaging means for contacting the handle of the tooth brush in secure engagement, said handle means having a first open end with a first fastening portion and a second opposite end that is closed in liquid-tight fashion when the tooth brush is received in said handle means,
a reservoir means having a liquid-tight reservoir wall portion defining a reservoir interior for receiving a brush portion of the tooth brush, said reservoir wall portion including an opening having a second fastening portion connectable in liquid-tight engagement with said first fastening portion of said handle means, said reservoir wall
a neck portion and
a bulb portion of enlarged interior diameter relative to said neck portion, said bulb portion including at least two substantially flat exterior surfaces, a first of said substantially flat surfaces being opposite said opening so that said reservoir means retains liquid when rested on said first surface, a second of said substantially flat surfaces being opposite a selectively sealable filler opening in said reservoir means.

4,884,689
FLEXIBLE TOOL CASE ACCESSORIES COMPARTMENT ASSEMBLY STRUCTURE
Chen Su-Chin, 4F., No. 131, Kwei Lin Road, Taipei, Taiwan
Filed Feb. 27, 1989, Ser. No. 315,870
Int. Cl.[4] B65D *1/24*
U.S. Cl. 206—372 **1 Claim**

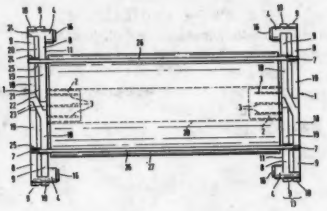


1. A flexible tool case accessories compartment assembly structure including a vertically grooved inner wall made on either corner inside a tool case to define a receiving space; a plurality of stake racks in different length having vertical grooves made thereon at equal interval, being provided to match with said vertically grooved inner wall so as to flexibly divide said receiving space into a variety of compartments; a plurality of stop logs being made on the top of said receiving space to surround said receiving space with one free side left as an opening so as to define a sliding way therebelow for a cover board to set therein from said opening to further cover said receiving space, said opening being arranged at one side edge of said tool case so as to allow said cover board be firmed retained to cover said receiving space when said tool case is closed up.

4,884,690
END WALL OF MOLDABLE MATERIAL FOR A WOUND ROLL
Otto Kleuter, Much, and Klaus Burk, Overath-Vilkerath, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Mar. 8, 1989, Ser. No. 320,712
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808064
Int. Cl.[4] B65D *85/66*
U.S. Cl. 206—416 **8 Claims**

1. An end wall of moldable material for a wound roll com-

prising a rectangular plate which comprises a front side facing said roll and comprising a smooth flat surface, a central insertion plug and a plurality of locking bosses, a rear side facing outward and comprising a plurality of radial and annular ribs, whereby said rear side is stiffened, a plurality of rounded corner surfaces, and four side walls comprising a plurality of



stacking bosses on the surfaces thereof, said stacking bosses limiting a plurality of stacking pockets of complementary design to said stacking bosses, whereby said stacking bosses and stacking pockets of each of said side walls are jointlessly connectable to the corresponding stacking pockets and stacking bosses, respectively, of any one of the four side walls of a second adjacently disposed end wall.

4,884,691

DEVICE FOR STORING A DATA DISKETTE IN A FILE FOLDER

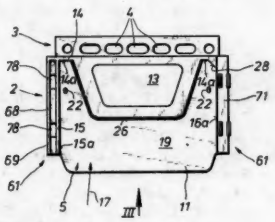
Dietmar Behrens, Dusseldorf; Waldemar Hoog, and Rudolf Zimmermann, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Elba-Ordner-Fabrik Kraut & Meienborn GmbH & Co., Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 180,363

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712803

Int. Cl.[4] B65D *85/30*

U.S. Cl. 206—444 **10 Claims**



1. Device for storing data diskettes in records and files such as folders or the like, comprising:

a flat holder part for one planar diskette;

a folder margin provided on one side edge of said holder part, said folder margin having folder holes;

said holder part having a receptacle for securing the diskette in the direction of three side edges thereof as well as in a direction perpendicular to the plane of the diskette;

said receptacle having an insertion opening on one side for insertion of the diskette into said receptacle and for removal of the diskette, respectively, in the direction of the diskette plane;

said holder part further having holding means for holding the diskette in said receptacle;

said holder part together with said folder margin forming a one-piece molded plastic part;

said folder margin being opposite said insertion opening and extending along said holder part one side edge transversely to the direction of insertion of the diskette; and

said holding means comprising at least one catch for locking into a recess of the diskette as the diskette is inserted into the receptacle in the direction of the diskette plane.

4,884,692

APPARATUS AND METHOD FOR STORAGE AND TRANSPORTATION OF 3.5 INCH FLOPPY DISKS

D. Weldon Middlebrooks, 405 Jefferson St., Arlington, Tex. 76012

Filed Feb. 15, 1989, Ser. No. 311,335

Int. Cl.[4] B65D *85/30*; B65B *23/00*

U.S. Cl. 206—444 **19 Claims**

1. An apparatus for the storage of and, if needed, the transportation of a substantial quantity of floppy computer disks which are generally described as 3.5 inch disks, comprising:

(a) a non-metallic and non-magnetic case having a lid and a box-like tray, and the tray having an internal space with a width, a length and a height, said internal space being wide enough to accommodate at least three side-by-side columns of 3.5 inch floppy disks, and said internal space being at least ten inches long so as to accommodate columns of at least 70 floppy disks, and said space being about 3.7 inches high, whereby a plurality of 3.5 inch floppy disks can be placed in said internal space in such a manner that they are erect;

(b) a plurality of resilient filler blocks that are non-metallic and non-magnetic and are sized to initially fill at least most of the internal space in said tray, said blocks being arranged into at least three columns, and the blocks in at least a given column being interconnected, and the connections between adjacent blocks being sufficiently strong as to render a given column of interconnected blocks susceptible to being handled as a unit-while at the same time the connections between the blocks are sufficiently weak as to permit easy breakage of one or more of the connections in order that a given block may be separated from the remaining blocks in a columns, whereby a given block may be removed and replaced with a quantity of floppy disks, and whereby several filler blocks may be removed and replaced with anyone or more of the things selected from the group consisting of floppy disks, manuals, printed reference materials, hard copies and selected computer devices; and

(c) a plurality of rigid dividers, each of which is adapted to be positioed between two adjacent columns of filler blocks so as to foster the orderly alignment of filler blocks within the tray's internal space, said dividers also fostering the orderly arrangement of any disks or other materials that may have selectively replaced one or more blocks in the internal space, and the dividers also be non-metallic and non-magnetic.

4,884,693

PACKAGE

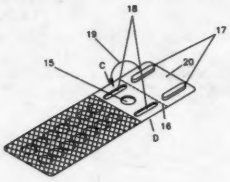
Emil Brütsch, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 132,297, Dec. 15, 1987, which is a continuation of Ser. No. 896,573, Aug. 18, 1986, abandoned, which is a continuation of Ser. No. 677,961, Dec. 4, 1984, abandoned. This application Sep. 30, 1988, Ser. No. 252,087

Claims priority, application United Kingdom, Dec. 9, 1983, 8332933; Mar. 15, 1984, 8406730

Int. Cl.[4] B65D *85/48*

U.S. Cl. 206—470 1 Claim



1. A blister packaging card including closure for at least one blister thereof said closure means being provided by a negative and positive blister located at the end of the card which are adapted to mutually engage to form a sealed cavity and are integral with the card one of said blisters being detachably engaged on one side thereof to the packaging card whereby said blister when detached from the packaging card along said one side may be folded flap-like to engage and removably seal the other blister.

4,884,694

GAS-STERILIZABLE PACKAGE, COVER OF AND ARRANGEMENT FOR PRODUCING THE SAME

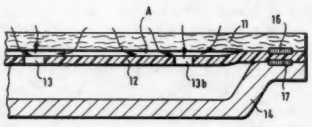
Karl-Heinz Sengewald, 4802 Halle, Westf. 1, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 901,027, Aug. 27, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 213,615

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1985, 3530484; Jul. 12, 1986, 3623568

Int. Cl.[4] B65D *5/64*

U.S. Cl. 206—484.1 30 Claims



1. A package to be gas-sterilizable, comprising a lower foil composed of a thermoplastic material and having an edge; an upper gas-permeable foil having an edge, said lower foil and said upper foil being connected with one another in the region of said edges; an intermediate gas-permeable foil arranged to protect said upper foil from a content of the package, located between said upper and lower foils and loosely extending over said upper foil, said intermediate foil being perforated and formed of thermoplastic material, said intermediate foil having an edge and upper and lower sides and being simultaneously connected by welding at said lower side with said lower foil and at said upper side with said upper foil only in the region of said edges so that a gas distributing chamber is formed between said upper foil and said intermediate foil; and means for connecting said intermediate foil with said upper foil and means for connecting said intermediate foil with said lower foil, said connecting means being formed so that the connection of said intermediate foil with said upper foil is stronger than the connection of said intermediate foil with said lower foil, so that in a closed condition of a package said intermediate foil extends loosely over said upper foil and is connected with said lower and upper foils only in the region of said edges to form said gas distributing chamber, but upon opening the package said intermediate foil is left at said upper foil.

4,884,695

PACKING CONTAINER

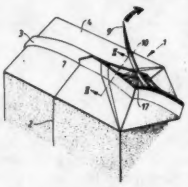
Tom Kjelgaard, Löddeköpinge, Sweden, assignor to Roby Teknik Aktiebolag, Lund, Sweden

Filed Dec. 20, 1988, Ser. No. 286,876

Claims priority, application Sweden, Dec. 23, 1987, 8705153

Int. Cl.[4] B65D *5/70, 5/74*

U.S. Cl. 206—631.2 14 Claims



1. A packing container manufactured from a fibrous packing material coated with plastic on an inside surface and having a sealing fin, extending across an upper end wall of the container, said packing material joined inside to inside in a sealed union to form packing material layers, said packing material layers accomodating between them, along at least a part of the sealing fin, a tearing strip, said tearing strip being disposed in the sealing fin, said tearing strip comprising a pull-lug accessible from outside the container, said tearing strip being sealed to an inner plastic coating of the packing material, said packing material, at least within a region of the sealing fin accommodating the strip, having a material layer adapted to weaken adherence between a fibrous layer and an inner plastic coating of the packing material, the adherence between the fibrous layer and the inner plastic coating of the packing material being less than the adherence between the tearing strip and the inner plastic coating within said region of weakened adherence of the sealing fin.

4,884,696

METHOD AND APPARATUS FOR AUTOMATICALLY INSPECTING AND CLASSIFYING DIFFERENT OBJECTS

Kalman Peleg, Washington State University, Department of Argicultural Engineering, Pullman, Wash. 99164, assignor to Kaman Peleg, Haifa, Israel

Filed Mar. 21, 1988, Ser. No. 170,307

Claims priority, application Israel, Mar. 29, 1987, 82037

Int. Cl.[4] B07C *5/02, 5/07, 5/08, 5/10*

U.S. Cl. 209—545 25 Claims

2. An apparatus for automatically inspecting, classifying, sorting and grading discrete objects of different product classes in accordance with their distinctive features and properties, by successively examining both sides of each said object, comprising,

a first, upper chain conveyor running between a front set of chain wheels and a rear set of chain wheels, containing at least one longitudinal lane of equidistantly spaced cups or trays each shaped to hold one object of a particular product class,

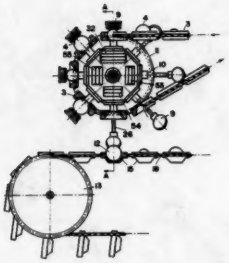
a loading station for positioning one said object into one said cup or tray,

a second, lower chain conveyor running underneath said first conveyor in parallel and spaced relationship, in synchronized manner but in opposite sense of direction, and containing at least one lane of equidistantly spaced cups or

trays each shaped to hold one object of said particular product class,

a transfer station at the rear end of said first conveyor comprising a plurality of gripper units rotating at the rotational speed of said rear set of chain wheels for retaining each object in its cup or tray during its downward travel around said chain wheels and to gently release it into a corresponding cup or tray of said second conveyor,

discharge means positioned along said second conveyor for discharging each object out of its cup or tray into one of a plurality of consecutively arranged collecting stations each destined to hold or convey all objects of same or similar features and properties,



sensor means positioned along said first and said second conveyor for sensing the features and properties of each said object on the first side facing the respective sensors positioned along said first conveyor, and on the opposite side facing the respective sensors positioned along said second conveyor, and to transmit to computer means signals relating to the position of each said object on said conveyors and to the features and properties or functionality according to which said objects are to be classified,

computer means for transmitting signals to said discharge means with regard to each object, effecting said discharge means to discharge object out of its cup or tray into its appropriate collecting station in accordance with a predetermined combination of the sensed features and properties.

4,884,697

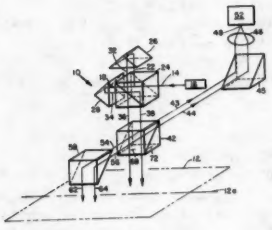
SURFACE PROFILING INTERFEROMETER

Peter Z. Takacs, P.O. Box 385, Upton, N.Y. 11973, and Shi-Nan Qian, Hefei Synchrotron Radiation Laboratory, University of Science and Technology of China, Hefei, Anhui, China

Filed Jun. 21, 1988, Ser. No. 209,549

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—360 **14 Claims**



1. An interferometer for profiling the surface along one axis of an optical surface comprising:

a. an incoming light beam;

b. first beam splitter means optically oriented to receive and to split said incoming light beam into first and second pencil light beams;

c. first reflector means to reflect back into said first beam splitter means the first pencil light beam;

d. second reflector means to reflect back into said first beam splitter means the second pencil light beam;

e. said first beam splitter means including means to direct outwardly said first and second pencil light beams parallel to and laterally displaced from each other along said axis;

f. second beam splitter means for receiving from said first beam splitter means and passing through said first and second pencil beams toward said optical surface, said optical surface being oriented to reflect said first and second pencil beams back to said second beam splitter means;

g. said second beam splitter means including means to redirect the reflected first and second pencil beams away from said first beam splitter means;

h. means to receive the redirected first and second pencil beams and form an interference pattern from said redirected first and second pencil beams to represent the profile of said optical surface; and

i. said first and second reflector means being positioned to obtain a predetermined path difference between said first and second parallel beams from said first beam splitter means to said optical surface.

4,884,698

APPARATUS FOR HANDLING SHEETS OF PAPER

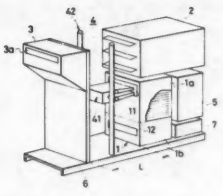
Hirotaka Tutamune; Yasuo Shiragai; Yoshiaki Karino, and Yasuyuki Wakasa, all of Niigata, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 13, 1986, Ser. No. 874,131

Claims priority, application Japan, Jun. 17, 1985, 60-129822; Jul. 5, 1985, 60-146505; Sep. 10, 1985, 60-198433

Int. Cl.[4] B07C *5/38;* **G07D** *7/00*

U.S. Cl. 209—534 **119 Claims**



1. An apparatus for handling sheets of paper, comprising:

a single port providing a first terminus permitting customers during a deposit transaction to put sheets of paper into and during a dispensing transaction to remove sheets of paper from said apparatus;

accommodating means including a second terminus, for accommodating storage of sheets of paper between transactions and for accommodating passage of sheets of paper at said second terminus during said transactions;

single counting means accessible to sheets of paper from both said port and said accommodating means and providing a third terminus receiving and storing sheets of paper and other termini storing sheets of paper, for counting, discriminating between sheets of paper and dividing said sheets of paper among said other termini on the basis of said discriminating into sheets of paper to be dealt with and sheets of paper not to be dealt with, during both deposit and dispensing transactions; and conveying means for distributing sheets of paper en bloc among said port, accommodating means and counting means during both deposit and dispensing transactions, said second, third and

other termini being arranged in a vertical row along a path of travel by said conveying means to enable said conveying means to obtain sheets of paper at said termini and to distribute sheets of paper en bloc among said accommodating means and counting means as said conveying means travels along the path;

wherein said conveying means moves sheets of paper between said port and said accommodating means via said counting means and between said accommodating means and said port via said counting means according to the type of transaction.

4,884,699

WINDING MACHINE

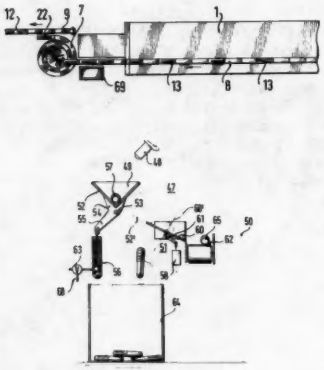
Wilhelm Maassen; Gregor Gebald, and Ulrich Thomas, all of Mönchengladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Continuation of Ser. No. 5,336, Jan. 15, 1987, abandoned, which is a continuation of Ser. No. 599,173, Apr. 11, 1984, abandoned. This application Sep. 20, 1988, Ser. No. 248,332

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1983, 3313468

Int. Cl.[4] B07C *5/34*; B65H *54/02*

U.S. Cl. 209—587 **3 Claims**



1. Winding machine assembly comprising transporting means for directly supplying to a winding machine of the assembly bobbins or spun coils from a spinning machine and for returning ejected tube sleeves to the spinning machine in a practically closed loop, and a device for comparing and adjusting a flow of the tube sleeves returned from the winding machine to a requirement for tube sleeves by the spinning machine, said transporting means being connected with a device for holding back ejected tube sleeves which are at least partly wound, said device for holding back the at least partly wound tube sleeves being provided with a device for testing for a presence of windings on the respective tube sleeves, said testing device being arranged near a testing station which alternatingly accepts and transfers a tube sleeve, and being operatively connected to a controllable tube sleeve gate disposed downstream from said test station and deflecting at least partly wound tube sleeves from the path of the tube sleeve flow, said device for comparing and adjusting the tube sleeve flow having an accumulation device for increasing the tube sleeve supply with at least partly wound tube sleeves, said device for holding back the at least partly wound tube sleeves being arranged in the path of the flow of the tube sleeves downstream from said device for comparing and adjusting the flow of the tube sleeves.

4,884,700

SORTING MACHINE

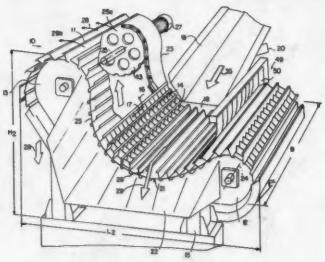
Günter Allgäuer, Uhldingen-Mühlhofen; Peter Strohhäcker, Ravensburg, and Dieter Fuchs, Waldburg, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Bezner GmbH & Co. KG, Ravensburg, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 113,447

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636650

Int. Cl.[4] B07B *13/05*

U.S. Cl. 209—685 **18 Claims**



1. A sorting machine for separation and sorting of a mixture of fine and coarse solid waste materials, comprising:

first and second return rollers at opposite longitudinal ends of the machine, horizontally spaced apart in a longitudinal direction: and

a conveyor belt having an exposed outer surface defined between first and second transversely spaced edges, trained over said first and second rollers so as to sag in a portion between said first and second rollers adjacent said first roller, said outer surface having open pocket-like recesses therein, the sagged portion of said conveyor belt being sufficiently steep and deep and said recesses being so shaped as to respectively form a means for repeatedly turning over the coarse material and a means for carrying away the fine material, when the mixture of fine and coarse material is provided onto said belt at said first edge and said belt is moved across said rollers in said longitudinal direction from said second roller toward said first roller, said outer surface declining in a transverse direction extending from said first edge to said second edge, the decline of said outer surface in said transverse direction serving to aid by gravitational force, movement of the coarse material in said transverse direction across said surface in said sagged portion and over said second edge.

4,884,701

ARTISTS' IMPLEMENT ORGANIZER

Hans Nymark, and Ellen Nymark, both of Old Stage Rd. and Davis Pl., Mt. Shasta, Calif. 96067

Continuation of Ser. No. 47,236, May 7, 1987, abandoned. This application Feb. 13, 1989, Ser. No. 310,470

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—69.8 **8 Claims**

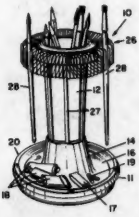
1. An artists' implement organizer, comprising:

a base having a bottom portion and a top portion, including a centrally located hub having an upwardly-facing receptacle therein and an annular dish about said hub;

an elongated hollow column having a bottom end which fits within the receptacle in the base whereby the column is supported by the base in a vertical orientation, said column having an open top end forming a receptacle therein for receiving elongated artist implements in a substantially vertical orientation and said column having an arcuately shaped, outwardly facing spring locating and mounting

surface thereabout spaced radially outwardly from said open top end; and

a helically-wound spring means adapted to be operably mated to and mounted on the spring locating and mounting surface on the column, held thereon by forces within said spring means created upon its expansion and placement about the mounting surface, and said spring means



having a plurality of closely spaced vertically oriented coils capable of gripping the sides of elongated artist implements and holding them vertically, said spring means being vertically aligned with said dish and being spaced above the dish sufficiently that the lower ends of the implements are spaced above, but over the dish of said base for the collection of matter from the elongated implements held by the coils.

4,884,702

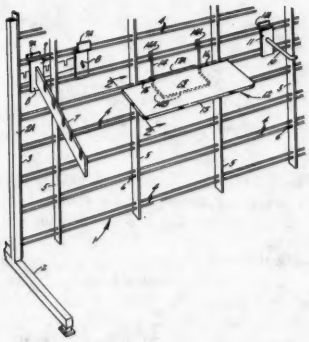
DISPLAY RACK

John A. Rekow, 23755 Anderson La., Newberg, Oreg. 97132

Filed Dec. 5, 1988, Ser. No. 279,728

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—90 **4 Claims**



1. A store display rack comprising in combination,

mounting means for floor installation,

upright end members for attachment to said mounting means,

pairs of horizontal rods vertically spaced from one another and carried by said end members, vertical stiffeners at points along said rods,

bracket means for supporting articles to be displayed, said bracket means having an upright segment for rested engagement with a pair of said horizontal rods and an upper end segment offset from said upright segment so as to engage and be supported by a superjacent pair of rods, and

a shelf, said shelf including edge structure having an offset portion insertable between a pair of said rods, said shelf supported by said bracket means and the last mentioned pair of rods.

4,884,703

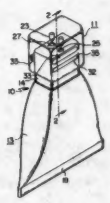
CONTAINER AND CLOSURE ASSEMBLY

John R. O'Meara, Jamesburg, N.J., assignor to CP Packaging Inc., Jamesburg, N.J.

Filed Sep. 27, 1988, Ser. No. 249,674

Int. Cl.[4] B65D *51/24*

U.S. Cl. 215—6 **14 Claims**



1. A multiple compartment container and closure assembly, comprising:

a container having at least two adjacent compartments with end portions terminating in a common surface at one end of said container, said end being sized to accept a cap and said surface having a thin wall portion in communication with each of said compartments;

a cap sized to slidably fit on said end of said container and having puncture means being positioned in alignment with each of said thin wall portions of said container so that movement of said cap from a first position on said end to a second position causes said puncture means to puncture the respective thin wall portion with which it is aligned, to permit access to the contents of said adjacent compartments; and

a surface of interference on said one end of said container positioned a predetermined distance from said thin wall portions, and a surface of resistance on the inside of said cap positioned to engage said surface of interference to locate said cap on said end portion at said first position to prevent inadvertent movement of said cap to said second position.

4,884,704

PERFUME CONTAINER

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Feb. 27, 1989, Ser. No. 316,017

Int. Cl.[4] B65D *33/28*

U.S. Cl. 215—12.1 **8 Claims**

1. A liquid container comprising:

(a) a plain glass bottle having a predetermined cross section, a flat bottom and an upper shoulder joined to a cap-receiving neck;

(b) a pouch formed of ornamental fabric material, said pouch

having a cross section matching that of the bottle to snugly receive the bottle, and a height which exceeds that of the bottle to define an upper section which extends above the shoulder, the upper section having an open mouth whose lip is provided with a drawstring which when pulled and then tied to the neck, causes the upper section to overlie and fully cover the shoulder and surround the neck whereby the bottle is then fully encased and the pouch conforms to its surface, save for the neck, and the ornamental fabric transforms the appearance of the bottle to provide an expensive looking container, said pouch being bonded to the surface of the bottle; and

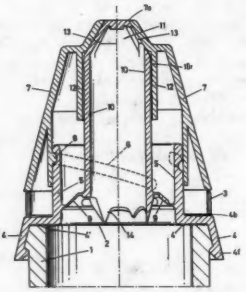
(c) a removable cap received on the neck and seated on the upper section surrounding the neck whereby no shoulder glass is then visible.

4,884,705

POURER PLUG FOR A RECEPTACLE

Jean Debetencourt, Maulde, Belgium, assignor to Lynes Holding S.A., Luxembourg, Luxembourg

Filed Jul. 26, 1988, Ser. No. 224,321
Claims priority, application Belgium, Jul. 27, 1987, 08700829
Int. Cl.[4] B65D *41/50*
U.S. Cl. 215—250 **10 Claims**



1. A pourer plug device for a receptacle having a neck equipped with a sealed lid, and comprising:

a plug element including means for securing said plug element to the receptacle over the sealed lid;

a cylindrical core disposed at a center of said plug element;

cutting means on an inner end of said core, for cutting the sealed lid;

flexible means for mounting said core on said plug element securing means, for movement from an initial position toward the sealed lid so that said cutting means moves from an initial position into a cutting position in which said cutting means cuts the sealed lid; and

a cap mounted for movement on said plug element, said cap being movable toward the receptacle from an initial position, to move said core and said cutting means to the cutting position, and said cap including a pouring aperture which is closed by an outer end of said core when said cap and said core are in their initial position, and which is opened when said cap is moved back to its initial position relative to said core after a sealed lid-cutting operation.

4,884,706

TAMPER INDICATING CONTAINER AND CLOSURE

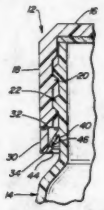
Randall K. Julian, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Feb. 21, 1989, Ser. No. 313,084
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **19 Claims**

1. A container for use with a tamper indicating closure of the type having an annular skirt and a tamper indicating ring attached to said skirt and separable therefrom upon axial movement of said closure from a closed to an open position relative to said container, said container comprising:

a neck portion having fastening means for cooperation with complementary fastening means on said closure,

retainer means flexible relative to said container and extending radially outwardly and downwardly from said neck portion below said fastening means, said retainer means having end portions engageable with complementary lip means on said tamper indicating ring to resist axial movement of said tamper indicating ring relative to said container upon separation of said complementary fastening means during removal of said closure from said container.

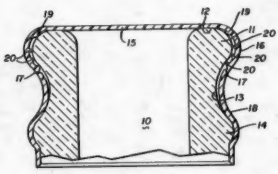


4,884,707

WATER BOTTLE CAP

Harry E. Crisci, New Castle, Pa., assignor to Northern Engineering and Plastics Corp., New Castle, Pa.

Filed Jan. 30, 1989, Ser. No. 303,130
Int. Cl.[4] B65D *41/48*
U.S. Cl. 215—256 **3 Claims**



1. In combination a rigid water bottle having a neck with a flat annular upper end, a first annular external bead on said neck adjacent said flat end and a second annular external bead on said neck spaced below said first bead, a downwardly inwardly-outwardly curving portion having a minimum diameter area between said first and second annular beads; and a cap of a resilient flexible plastic material having thin wall top and skirt portions and being of a diameter smaller than said minimum diameter area of said downwardly-inwardly curving portion of said neck, an inturned annular flexible sealing flange on said skirt portion adjacent said top portion positioned for registry with said first annular external bead, several secondary inturned annular sealing and fastening flanges on said skirt portion spaced below said flexible sealing flange and positioned for registry with a lower portion of said first annular external bead on said neck, said skirt having an annular groove therein below said secondary inturned annular flanges and means on said skirt below said annular groove and communicating therewith by which said skirt below said annular groove can be torn away, whereby said cap is stretched when positioned on said neck of said water bottle so as to tightly engage said first and second annular sealing and fastening flanges on said first annular bead and said downwardly inwardly-outwardly curving portion of said neck.

4,884,708
PRESSURE VESSEL

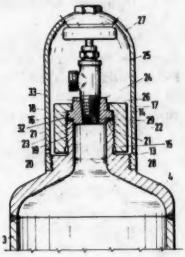
Ernst W. Lange, Mettmann; Karl Scholl, Oberhausen, and Dieter Vespermann, Moers, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 19, 1988, Ser. No. 259,999

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1987, 3736579

Int. Cl.[4] B65D *81/20, 85/84*

U.S. Cl. 220—3 **34 Claims**



1. Pressure vessel for storage of gas comprising:

a bottom part, a cylindrical jacket and a head part with a neck, said bottom, said jacket and said head part being made of a corrosionproof stainless steel having up to 0.06% C, from 1.5% to 6% Mn, from 0.3 to 1% Si, from 16 to 25% Cr, from 4 to 18% Ni, from 0 to 4% Mb, from 0 to 0.35% nitrogen, from 0 to 0.25% Nb, all percentages by weight, the remainder being iron with the conventional low level impurities, said parts following shaping, having been annealed and its interior surface electrochemically polished under insertion of a cathodic dc electrode having the approximate length of the cylindrical jacket;

a valve;

an adaptor for adapting dimensions of the valve to the neck and being connected to the neck and to said valve; and

a protective cap threaded onto an upper portion of said head part of the vessel.

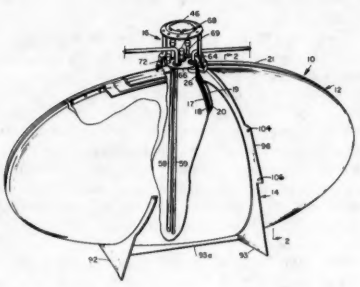
4,884,709
UNDERGROUND STORAGE TANK

Walton McCarthy, Northwood, N.H., assignor to Theta Technologies, Inc., Concord, N.H.

Filed Jan. 9, 1989, Ser. No. 294,717

Int. Cl.[4] B65D *6/02, 88/04*

U.S. Cl. 220—5 A **15 Claims**



1. An underground liquid storage tank comprising:

a. a hollow, elongated vessel comprising a wall which is a conic section of revolution;

b. said wall comprising an inner layer formed from a pair of clam shell rigid fiberglass reinforced plastic sections having rims bolted and cemented together forming a flange extending around the long dimension of said vessel, a layer of open celled material surrounding said inner layer, a liquid tight film enveloping the layer of opencelled material and said rims, and an outer layer of non-porous material sprayed on said film to form a seamless outer surface on said vessel;

c. opening means into said vessel perpendicular to the long axis of said vessel located substantially at the midpoint of said vessel; and

d. cell means containing all of the pipes and fittings associated with said vessel surrounding and attached to said neck comprising closure means located at or near ground level when said tank is installed for providing access to said pipes and fittings and said neck for supplying or withdrawing contents to or from said vessel.

4,884,710
HOUSING FOR A CHIP CARD READER

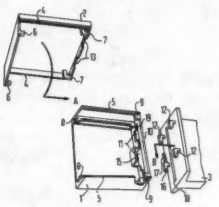
Peter Kleine, Fischen, and Klaus Wechsler, Puchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,214

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 8712368[U]

Int. Cl.[4] B65D *6/00*

U.S. Cl. 220—4 R **6 Claims**



1. A housing for a chip card reader comprising:

a base;

a cover for said base;

a cap for holding said base and said cover together engaged with said cap; and

means integrally formed on each of said base, cover and cap and for retaining said base, cover and cap in interconnected relation, said means being the sole means for interconnecting said base, cover and cap, said means for interconnecting including a plurality of respective recesses in said cover and in said base disposed in registry to form in combination a wall having a plurality of openings when said cover and base are engaged, a plurality of hooks on said cap received in said openings and simultaneously engaging said cover and said base, a deformable noise carried on at least one of said hooks, a receptacle disposed at said wall adjacent one of said openings to receive said noise, and a projection on said receptacle disposed to abut said noise in said receptacle to prevent said noise from exiting said receptacle.

4,884,711

CONTAINER SYSTEM FOR THE STORAGE OF WASTES

Helmut Bomhard, Starnberg; Ernst Fischer, and Dieter Rudat, both of Munich, all of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann AG, Munich-Riem, Fed. Rep. of Germany

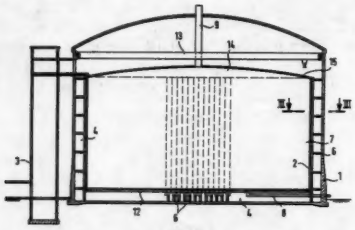
PCT No. PCT/EP87/00528, § 371 Date May 18, 1988, § 102(e) Date May 18, 1988, PCT Pub. No. WO88/01913, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 16, 1987, Ser. No. 210,510

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1986, 3631807

Int. Cl.[4] B09B *1/00*

U.S. Cl. 220—5 A 22 Claims



1. A container for storing substances comprising:

an inner casing having a plurality of separable elements for containing the stored substances;

an outer casing, spaced apart from the inner casing, opposite the stored substances for supporting the inner casing, the space between the inner and outer casings being large enough to allow access to the separable elements of the inner casing; and

at least one supporting element extending between the inner and outer casing for supporting the inner casing against the outer casing.

4,884,712

STACKABLE BOTTLE CASE

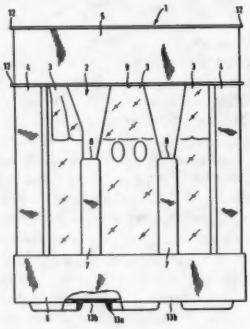
Martin Schoeller, and Christoph Schoeller, both of Haus Balaster, CH-7524 Zuoz, Graubunden, Switzerland

PCT No. PCT/EP87/00382, § 371 Date Mar. 14, 1988, § 102(e) Date Mar. 14, 1988, PCT Pub. No. WO88/00558, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 14, 1987, Ser. No. 183,756

Int. Cl.[4] B65D *1/24, 1/48*

U.S. Cl. 220—21 16 Claims



1. A plastic, stackable bottle case having compartment divisions for holding and separating bottles, comprising:

a case frame in the shape of a box with four side walls, a bottom surface and an open top;

at least one support profile at the intersections of each said side wall with another said side wall;

a peripheral handle strip in juxtaposition with said open top;

a peripheral bottom strip in juxtaposition with said bottom surface;

said support profile interconnecting between said handle strip and said bottom strip;

said support profile, said handle strip and said bottom strip defining the boundary limits of an open area in each of said side walls extending from said handle strip to said bottom strip;

at least one support strip disposed in said open areas in a position approximately between two of the bottles in at least one of said side walls and extending from said bottom strip toward said handle strip to form at least two display windows extending from said handle strip to said bottom strip;

means permitting stacking engagement between at least two of the cases;

said support profile and said support strips being self-contained, smooth-walled hollow sections drawn laterally into the interior of the case and shaped so as to conform to the contours of the bottles and form support surfaces therefor;

wherein, said open area permits the user to view a major portion of the contents of the case without removing the bottles or otherwise opening the case; and

the outer surfaces of said handle strip, said bottom strip, said support profile and said support strip lying in substantially the same plane.

4,884,713

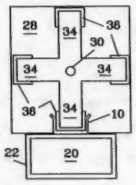
ARTICLE ORGANIZING DEVICE EMPLOYING HOOK AND LOOP FASTENING MATERIAL

Michael D. Handler, Norwalk, Conn., assignor to Velcro Industries, B.V., Amsterdam, Netherlands

Continuation of Ser. No. 893,386, Aug. 5, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 249,278

Int. Cl.[4] B65D *21/02, 71/00*

U.S. Cl. 220—23.4 13 Claims



1. An article organizer characterized by:

(a) a central base;

(b) a mounting member carried by said central base;

(c) at least one article holder for releasably mounting on said mounting member by engagement of first and second components of a touch fastening system;

(d) one of said article holder and said mounting member carrying a hinged shear trap channel member comprising a rigid back portion interconnecting two rigid side portions defining inwardly facing surfaces, having the first component of the touch fastening system on each of said inwardly facing surfaces; at least one of said side portions being connected to said back portion by hinge means; the other one of said mounting member and said article holder carrying a self-supporting rigid unitary planar fin member defining parallel outwardly facing surfaces, having the second component of the touch fastening system on its parallel outwardly facing surfaces; said fin member being of a shape such that said shear trap channel is capable of

surrounding the portion of said fin member carrying said touch fastener portions in a closely-fitting manner; said back portion of said hinged shear trap channel member being of a width such that said inwardly facing surfaces are substantially parallel to said outwardly facing surfaces upon engagement of said components of the touch fastening system, said width being sufficiently less than the combined height of said fin member and said touch fastener portions; whereby the fastener components act in shear to support said at least one article holder on said mounting member and said at least one side portion can be pivoted outwardly to effect progressive disengagement of the touch fastener components apart from one another when desired,

whereby the engagement of said engaging elements of the mating portions of the touch fastening system position said fin member in said shear trap channel in substantially rigid parallel relation and confine said inwardly and outwardly facing surfaces in a substantially fixed space relationship, which space is sufficiently less than the combined height of the components of the touch fastening system, wherein said shear trap channel is configured to substantially surround at least a portion of said fin member, thereby creating the confinement of relative movement of said members and the progressive resistance of said engaging elements when said members are moved relative to each other, so that attachment and detachment of the respective members is achieved only by forces substantially parallel to the respective surfaces of said fastener members in sufficient magnitude to overcome the progressive resistance of the engaging elements progressively engaging and disengaging as they are moved relative to each other.

4,884,714

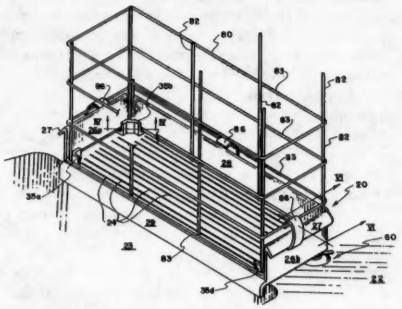
SECURABLE AND REMOVABLE UTILITY RECEPTACLE

James B. Bechtel, 116 Nottoway Dr., Penllyn, Pa. 19422

Filed Apr. 14, 1988, Ser. No. 181,699

Int. Cl.[4] A47J *47/16*

U.S. Cl. 220—69 **23 Claims**



1. A securable and removable utility receptacle for use on a countertop next to an edge of a sink comprising:

a. a supporting surface being a two-dimensional sheet-like base with a front portion and a rear portion, having a top surface and an oppositely-disposed bottom surface, said bottom surface having the front portion adapted to rest on a substantially flat two dimensional surface, adjacent the edge of a sink, with no affixing means attached thereto and to form an acute angle with the substantially flat two dimensional surface; and

b. at least one suction cup affixed to the rear portion of the bottom surface, said suction cup being removably securable to a predetermined spot on the countertop to position the receptacle at a predetermined position at the sink's edge when said bottom surface resides at said acute angle.

9. A securable and removable dish receptacle for use on a countertop next to the edge of a sink, comprising:

a. a supporting surface, being a two-dimensional, sheet-like base with a front portion and an oppositely-disposed rear portion and having a top surface and a bottom surface, said top surface having at its perimeter an orthogonally extending edge and said bottom surface making an acute angle with the countertop at the front portion.

b. retaining means fixed to the rear portion of the bottom surface for releasably retaining said receptacle in a predetermined position on the countertop;

c. a front edge extending from the front portion and adapted to fit the edge of a sink;

d. a dish fence supported on the top surface, said fence extending substantially around the perimeter of said surface; and

e. a plurality of clips secured on the top surface to releasably fasten said fence thereto.

16. A securable and removable cutting board assembly for use on a countertop next to the edge of a sink, comprising:

a. a supporting surface, being a two-dimensional, sheet-like base with a front portion and an oppositely-disposed rear portion and having a top surface and a bottom surface, said top surface having at its perimeter an orthogonally extending edge, and said bottom surface making an acute angle with the countertop at the front portion.

b. retaining means fixed to the rear portion of the bottom surface for releasably retaining said receptacle in a predetermined position on the countertop.

c. a front edge extending from the front portion and adapted to fit the edge of a sink;

d. a cutting board supported on the top surface; and

e. a plurality of clips secured on the top surface to releasably fasten said board thereto.

4,884,715

HOUSING FOR ELECTRICAL AND ELECTRONIC COMPONENTS

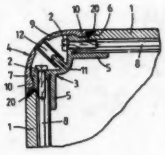
Franz Pohlmann, Minden, Fed. Rep. of Germany, assignor to Rose Elektrotechnik GmgH & Co. K.G., Porta Westfalica, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,246

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1987, 3734564

Int. Cl.[4] H05K *5/02*

U.S. Cl. 220—76 **3 Claims**



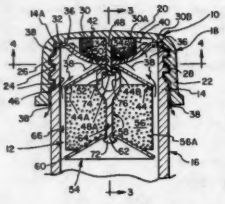
1. A housing for electrical and electronic components which includes several flat-shaped wall panels secured together by corner joints, each corner joint being formed from an internal retaining section including two wall panel locating strips which lie at right angles to one another, a fixing strip, for each locating strip, which lies in front of a mitred front edge of one of the several wall panels, the fixing strip and adjoining wall panel having securing screws passing therethrough from the mitred edge into the inner section of the wall panel to secure the fixing strip to the respective wall panel, and an external cover section secured to the respective retaining section, the junction point for the said cover section lying within the vertex

of the angle defined between the locating strips of the retaining section.

4,884,716
FUEL CAP WITH TETHERED ANTI-SPLASH ATTACHMENT

Ronald O. Steiner, Hilbert, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 31, 1989, Ser. No. 304,811
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—202 **26 Claims**



12. In a fuel cap having a cup-shaped body removeably attached to an end portion of a filler neck of a fuel tank, said fuel cap also having a central stem attached at one end to the interior of said body and extending axially therethrough to an opposite end having a connector element defined thereon, and an inner baffle supported by said stem and having a peripheral edge spaced inwardly from the interior of the filler neck end portion to define an inner annular space through which liquid fuel when splashed in the fuel tank can migrate upwardly past said inner baffle, an anti-splash attachment comprising:

an outer splash-back baffle located in the filler neck end portion in spaced relation below said inner baffle, said outer baffle having a peripheral edge spaced inwardly from the interior of the filler neck end portion to define an outer annular space axially spaced from said inner annular space and through which liquid fuel when splashed in the fuel tank can migrate upwardly past said outer baffle;

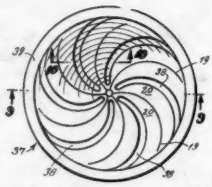
a gas permeable foam plug element located in the filler neck end portion between said inner and outer baffles; and

a retainer post supporting said outer baffle and said plug element and having defined on an inner end a complementary connector element for connecting said post to said connector element on said stem and thereby tethering said outer baffle and said plug element from said stem.

4,884,717
NON-SPILLING SNACK CONTAINER

Janice W. Bussard, 201 N. Fruitport Rd., Spring Lake, Mich. 49456, and Kelley B. Reenders, 1714 Dykhouse Ave., Grand Haven, Mich. 49417

Filed Mar. 20, 1989, Ser. No. 325,852
Int. Cl.[4] B65D *51/00*
U.S. Cl. 220—229 **3 Claims**

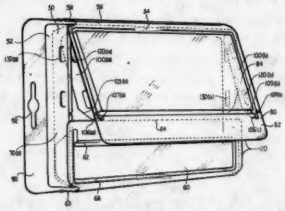


1. A non-spilling snack container, comprising, in combination, a receptacle, a quantity of removable dry-type snack food within said receptacle, said receptacle being open at its upper end, a cover made of flexible material closing said open end, and a plurality of crossing slits across a center of said cover forming a circle of tongues, said tongues in a downwardly flexed position forming a central opening through said cover for removal of said snack food from said receptacle; said crossing slits being spiral-shaped from said crossing center so that said tongues are spiral-shaped; a raised spiral-shaped rib upon an upper side of each said tongue, said rib extending along a length of said tongue; and a pleated flange connecting between adjacent side edges of said tongues.

4,884,718
CONTAINER WITH A RELEASABLE HINGED CLOSURE PANEL AND A FIXED CLOSURE PANEL

David J. Leahy, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 684,326, Dec. 20, 1984. This application Feb. 23, 1989, Ser. No. 314,529
Int. Cl.[4] B65D *43/16*
U.S. Cl. 220—339 **5 Claims**



1. A container of one-piece plastic construction for housing articles such as labels and the like, comprising;

a chamber for the articles, said chamber having an opening on one side for easy access to said articles therein,

a relockable cover system extending from opposite ends of said chamber, said cover system being manually releasable to provide access to said articles so that the articles may be easily removed from the chamber, said cover system being reclosable to cover and seal said chamber opening,

the cover system comprising a releasable panel and a fixed immobilized panel, the releasable panel being manually closeable over the chamber opening and at least partially covering the fixed panel to seal said chamber opening, the releasable panel in closed position having a lip edge extending over an exposed edge of the fixed panel to seal the chamber opening, and said releasable panel being permanently connected to the chamber by an integrally molded hinge,

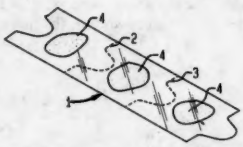
means integrally molded with said container for relocking the cover system over the chamber opening so that the cover system will not self open after it is closed over the chamber opening, wherein said relocking means functions to lock said releasable panel to the fixed panel so that even if the container is tilted the releasable panel will not self open after it has been closed over the chamber opening, said relocking means comprising a panel extending from the releasable panel in the direction of the chamber opening, said extending panel terminating at one end thereof with an inclined edge and a grooved portion over the incline, so that as the releasable panel is closed over the chamber opening the exposed edge of the fixed panel contacts said incline and thence said exposed edge of the fixed panel engages said grooved portion thereby locking said releasable panel to said fixed panel.

4,884,719

SINGLE-SAMPLE DISPENSING

Sol Levine, Morristown, N.J., and Hernando Sanchez, New York, N.Y., assignors to Revlon, Inc., New York, N.Y.

Filed Dec. 30, 1986, Ser. No. 947,777
Int. Cl.[4] G07F 11/00
U.S. Cl. 221—25 31 Claims



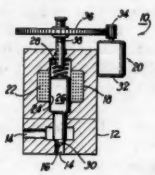
1. A cosmetic sampler adapted for the manual dispensing of cosmetic product samples at a point-of-purchase location, comprising supporting means for supporting a plurality of cosmetic product samples, said supporting means including first dividing means for dividing said supporting means into a plurality of individual dose units in such a manner that each of said dose units is connected to but separable from at least one adjoining dose unit, each of said dose units containing a cosmetic product sample; covering means for covering said cosmetic product samples contained on said supporting means, said covering means including second dividing means for dividing said covering means into a plurality of protective top pieces in such a manner that each of said top pieces is connected to but separable from at least one adjoining top piece, each of said top pieces being arranged in overlying registry with a corresponding one of said dose units so as to protect said cosmetic product sample contained thereon; and attaching means for attaching said covering means to said supporting means in such a manner that each of said top pieces is removably attached to its corresponding dose unit at a plurality of spaced-apart locations, the spacing between said locations being selected so as to provide a top piece which has been separated from its said at least one adjoining top piece with a plurality of substantially free tab sections, each of said tab sections being located at a peripheral region of said top piece and being readily accessible for gripping by a user, whereby said top piece may, after its corresponding dose unit has been separated from its said at least one adjoining dose unit, be gripped by a user at a randomly chosen one of said tab sections and then removed to expose said cosmetic product sample protected thereby.

4,884,720

POST-MIX BEVERAGE DISPENSER VALVE WITH CONTINUOUS SOLENOID MODULATION

Roger C. Whigham, Atlanta, and John H. Bearden, Marietta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Jun. 5, 1987, Ser. No. 58,448
Int. Cl.[4] B67D 5/08
U.S. Cl. 222—54 4 Claims



1. A beverage dispenser valve comprising:

(a) a water conduit and a separate syrup conduit, each including a valve seat;

(b) a solenoid valve associated with each of said conduits for controlling the flow therethrough, at least one of said solenoid valves including an armature with a graduated flow control valve member on its distal end positioned to contact a valve seat to close the respective conduit to flow therethrough when said solenoid valve is de-energized;

(c) means for energizing said solenoid valves to open them when it is desired to dispense a drink from said dispenser valve;

(d) at least one of said solenoid valves including movable stop means for controlling the position of said armature when said solenoid valves are energized, such that the area of the flow opening through said valve seat can be controlled by moving said stop means;

(e) means for moving said movable stop means to control the flow through at least one solenoid valve; and

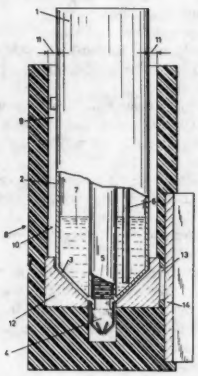
(f) said moving means including a motor, and gear means connecting said motor to said movable stop, said movable stop being located at least partially in said armature tube.

4,884,721

COOLING HOLDER FOR HAND-HELD WHIPPED CREAM DISPENSER

Manfred Kirchler, Mutterstrasse 5, Feldkirch, Austria

Filed Jun. 10, 1988, Ser. No. 205,438
Claims priority, application Austria, Jun. 17, 1987, 1549/87
Int. Cl.[4] B67D 5/62
U.S. Cl. 222—146.6 3 Claims



1. A holder for a hand-held whipped cream dispenser having a shaped housing containing a supply space for receiving cream, the housing having an outlet nozzle at a cone-shaped end face thereof and containing whipped cream producing means connected to the outlet nozzle so as to produce and discharge whipped cream through the outlet nozzle, the holder comprising: a wall defining an upwardly opening cavity formed so as to correspond to the shape of and accommodate the housing of the dispenser so that at least a portion of the housing extends above the cavity, said wall having at least a portion forming the bottom of the cavity made of heat conducting material; and a Peltier element having a cold side in thermal contact with the portion of the wall made of heat conducting material, and a warm side with a profile strip of heat conducting material and a cone-shaped cross-section, the wall portion forming the bottom of the cavity being formed as a hollow cone corresponding to the shape of the end face of the housing so that the two conical surfaces rest against each other and form an intermediate space between a side wall of the

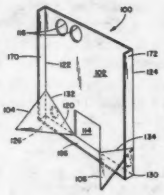
cavity and the housing of the dispenser when the dispenser is received in the holder, so that the outlet nozzle is cooled.

4,884,722

BULKHEAD AND LINING SYSTEMS FOR CARGO CONTAINERS

Victor T. Podd, 255 Beverly Avenue, Montreal, Quebec, Canada

Continuation of Ser. No. 920,030, Oct. 16, 1986, Pat. No. 4,799,607. This application Sep. 27, 1988, Ser. No. 249,893
The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—535 **15 Claims**



1. A moveable bulkhead, comprising:

a rectangular, generally vertical and moveable wall member including

(i) a lower portion

(ii) an outlet opening in the lower portion to conduct a cargo through the bulkhead, and

(iii) a bottom edge and first and second side edges, the bottom and first side edges forming a first lower corner, and the bottom and second side edges forming a second lower corner; and

a first corner member connected to the wall member adjacent to the first lower corner and along a connecting line extending upward away from the outlet opening and toward the first side edge;

the first corner member being connected to the wall member for movement between open and closed positions, and wherein

(i) in the closed position, the first corner member is adjacent the wall member, and

(ii) in the open position, the first corner member slants outwardly downwardly away from the wall member, and laterally inwardly downwardly away from the first side edge and toward the outlet, to guide the cargo downwardly and laterally inwardly.

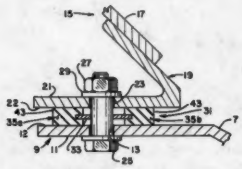
4,884,723

HARD GASKET FOR RETROFIT INSTALLATION ON HOPPER OUTLET/HOPPER GASKET OUTLET

Richard H. Dugge, St. Louis, Mo., assignor to ACF Industries, Incorporated, Earth City, Mo.

Continuation of Ser. No. 41,839, Apr. 23, 1987, abandoned. This application Jun. 7, 1989, Ser. No. 363,441
Int. Cl.[4] B65D *53/00*; B67D *5/06*; F16J *15/10, 15/12*
U.S. Cl. 222—542 **7 Claims**

1. In a hopper for storing a particulate, fluent lading material, the hopper having an opening in the bottom thereof through which the material is discharged from the hopper and a hopper frame about the opening; and, an outlet assembly secured to the bottom of the hopper about the opening for material discharged through the opening to be entrained in a fluid medium and carried away from the hopper, the outlet assembly having an outlet frame secured to the hopper frame to attach the outlet assembly to the hopper, the improvement comprising: a compressible gasket fitting between the hopper frame and the outlet frame for forming a seal between the hopper and the outlet assembly, the gasket extending perimetrically about the opening to form a continuous seal completely sealing the opening, the gasket having an inner sealing section adjacent the opening, an outer sealing section, and an intermediate section between the inner and outer sections, the inner and outer sections each being relatively thicker than the intermediate section and compressed when the outlet assembly is attached to the hopper, each of the inner and outer sections having an inner face with one of the inner faces being substantially orthogonal to the intermediate section for the transition in thickness therebetween to be abrupt, the inner section having an outer edge adjacent the opening with the portion of the inner section adjacent the outer edge being thicker than the portion of the inner section adjacent the intermediate section, the inner section further having a concave outer face, the degree of concavity being such that when the gasket is compressed, the outer face becomes substantially perpendicular with respect to both the hopper frame and the outlet frame thereby eliminating any spaces between the gasket and the hopper frame and the gasket and the assembly frame in which particles of material can be trapped and contaminate material subsequently stored in the hopper.

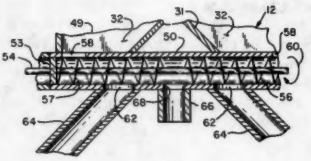


4,884,724

SCREW AUGER CHEMICAL APPLICATOR

La Vern Schmidt, P.O. Box 234, Montezuma, Kans. 67867

Filed Aug. 26, 1988, Ser. No. 237,282
Int. Cl.[4] G01F *11/00*
U.S. Cl. 222—623 **4 Claims**



1. A screw auger chemical applicator machine comprising, a mounting frame secured to a towed frame, for towing behind a farm tractor, a plurality of hoppers secured to said mounting frame, for dispensing chemical or small seed, an auger sleeve secured to each hopper of said plurality of hoppers, for housing a pair of augers that feed said chemical or small seed, a common shaft provided in said machine, for rotating said pair of augers, a drive train secured to said machine, for rotating said common shaft that rotates said pair of augers, wheel means secured to said machine, for driving said drive train, and a by-pass tube secured to said auger sleeve, for preventing compacting of said chemical or small seed, wherein each said hopper is mounted between a pair of short hopper support members and a pair of long hopper support members that are fixedly secured to said mounting frame that is secured to said towed frame that is horizontal to a ground surface, and said auger sleeve is fixedly secured to a front bottom end of said hopper, and a pair of openings in said bottom end of said hopper, aligned with a pair of openings through said auger sleeve for feeding said chemical or small seed into said auger

sleeve, wherein a sump divider wall is fixedly secured to inside surfaces of walls of said hopper and a central portion is angled upward, causing said chemical or small seed to gravity feed out of two areas in said hopper into the openings through said auger sleeve, and a second pair of openings through said auger sleeve are provided and release said chemical or small seed into a pair of feed-out tubes that are angularly disposed to each other and are fixedly secured at one end over the second pair of openings through said auger sleeve, and said by-pass tube is located between said second pair of openings.

4,884,725

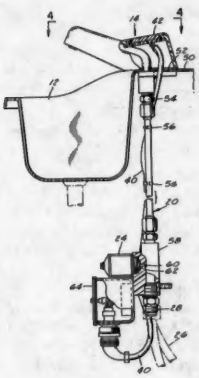
WATER DISPENSING SYSTEM

Munir J. Ahad, 27514 Sycamore Creek Dr., Valencia, Calif. 91355, and Sven A. Pettersson, 1227 24th St., Santa Monica, Calif. 90404

Division of Ser. No. 929,749, Nov. 12, 1986, Pat. No. 4,784,303. This application Apr. 6, 1988, Ser. No. 178,134

Int. Cl.[4] B67D *5/08*

U.S. Cl. 222—639 **2 Claims**



1. A water dispensing system for an aircraft comprising:

a water supply including a source of hot water and a source of cold water,

vent means in communication with the water supply which closes upon the water supply being filled with water to allow the water to be pressurized and, when the aircraft is on the ground and being drained, vents the water supply to atmosphere,

a washbasin and faucet combination, said faucet being disposed above the washbasin,

conduit means between the faucet and water supply including a common channel which at one end is in communication with the faucet and at the other end is in communication with the source of hot water and the source of cold water,

manually operable switch means for controlling the delivery of water from said water supply to the faucet,

said switch means including a first switch controlling the operation of a first solenoid valve means for turning on the flow of hot water and a second switch controlling the operation of the second solenoid valve means for turning on the flow of cold water,

said first and second solenoid valve means being coupled to timing control means for selectively controlling the timing cycle during which said first and second solenoid valve means are energized,

the timing control means including means which, when one switch is actuated to energize one of the solenoid valve means and the other switch is also actuated during a predetermined period, resets the timing cycle so that both solenoid valve means are energized for the same length of time, and in said dispensing system, the water flowing from the faucet comprises approximately equal volumes of water from said source of hot water and said source of cold water.

4,884,726

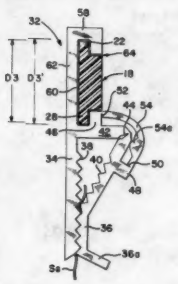
HANGER FOR SUPPORTING PLURAL GARMENTS

Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B & G Plastics, Inc., New York, N.Y.

Filed Aug. 18, 1988, Ser. No. 234,212

Int. Cl.[4] A47G *25/48*

U.S. Cl. 223—91 **12 Claims**



1. In combination, for the hanging of plural garments:

(a) a hanger having a body portion for hanging a first garment, said body portion having a central opening, a hook portion extending outwardly of said body portion and a cross-member, said body portion and said cross-member bounding said central opening; and

(b) snap-hinge means in the form of an integral body for the hanging of a second garment, comprising

(1) first and second hinge members for releasable retention of said second garment,

(2) a snap-hinge selectively operable for biasing said first and second hinge members into such retention of said second garment in one state thereof and for biasing said first and second hinge members to release said second garment from such retention in a second state thereof, and

(3) detent means for securement of said snap-hinge means to said cross-member irrespective of the state of said snap-hinge.

4,884,727

HANGER WITH SNAP-ON ADJUSTABLE CLIPS

Russell O. Blanchard, Zeeland, Mich., assignor to Batts, Inc., Mich.

Filed Jan. 27, 1989, Ser. No. 303,496

Int. Cl.[4] A47G *25/48*

U.S. Cl. 223—93 **27 Claims**

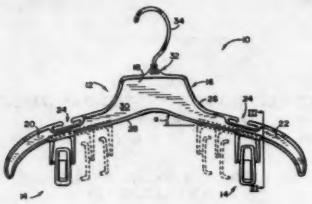
1. An article hanger for garments and the like, said hanger comprising:

a hanger body, said body defining an elongated bottom flange having a slope angle;

article clamp means defining opposed clamping surfaces for clampingly engaging an article and suspending the article from the hanger body; and

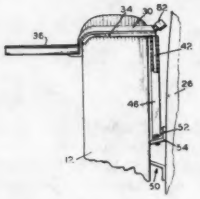
attachment means connected to said clamp means for adjustably attaching said clamp means to said hanger body

bottom flange for movement along said bottom flange, said attachment means including a top portion having an



angle from horizontal which is the same as the slope angle of said bottom flange.

4,884,728
BICYCLE CARRIER
William A. Temple, 2974 Ingalls Way, Eugene, Oreg. 97405
Filed Apr. 14, 1989, Ser. No. 337,831
Int. Cl.[4] B60R *9/10*
U.S. Cl. 224—42.13 **6 Claims**



1. A bicycle carrier, for use with an external, vertically mounted spare tire as found attached to a spare tire carrier mount on sports utility vehicles, recreational vehicles, vans, and the like, comprising:

a. a spare tire supported framework, which includes:

a first horizontal bar member and a second horizontal bar member, in parallel, spaced relationship, the first horizontal bar member lying to the outside of the spare tire and the second horizontal bar member lying to the inside of the spare tire, between the spare tire and the body of the vehicle;

a plurality of tire support members formed to lay against the tread of the spare tire at spaced locations along the circumference of the upper portion of said spare tire, each said tire support member being attached between the first horizontal bar member and the second horizontal bar member, so as to form a framework which is supported by the spare tire;

bicycle support means, which include a plurality of bicycle support arms which extend outwardly from the first horizontal bar member so as to project beneath portions of, and support, the bicycle; and

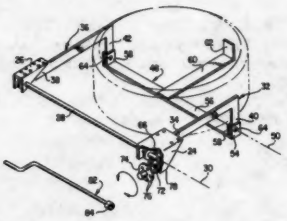
a vehicle mounting member perpendicularly attached to the second horizontal bar member, and extending downwards from the attachment; and

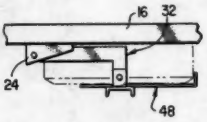
b. a framework positioning and vehicle attachment means, which include:

a positioning member extending upwardly and formed to engage with the downwardly extending vehicle mounting member so as to position the spare tire supported framework relative to the spare tire; and

vehicle attachment means which attach the upwardly extending positioning member to a vehicle spare tire carrier mount.

4,884,729
SPARE TIRE RACK
Ronnie Barkouskie, Mexia, Tex., assignor to Dutton-Lainson Corporation, Hastings, Nebr.
Filed Mar. 17, 1988, Ser. No. 169,490
Int. Cl.[4] B62D *43/04*
U.S. Cl. 224—42.21 **9 Claims**





1. A spare tire rack for holding a spare tire on a vehicle having parallel frame members, comprising:

a first bracket mounted to a first of said frame members;

a second bracket mounted to the other of said frame members;

a movable section including:

(a) a rod pivotally supported between said first and second brackets for pivotal motion about a horizontal axis;

(b) a first arm having an inner end and an outer end, said first arm secured at its inner end to the rod proximate the first bracket;

(c) a second arm having an inner end and an outer end, said second arm secured at its inner end to the rod proximate the second bracket;

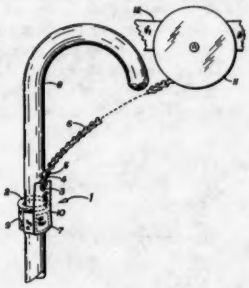
(d) a cross piece pivotally connected between said first and second arms at the outer ends thereof for limited pivotal motion, a stop formed on at least one of said arms to limit the motion, the spare tire resting on the cross piece; and

means for pivoting said movable section between a storage position proximate the parallel frame members and a release position, the cross piece pivoting against the stop proximate the storage position to store the tire horizontally, said cross piece pivoting relative said first and second arms as the movable section moves to the release position to provide easy access to the spare tire.

4,884,730
CANE GUARD
Conrad L. Carpenter, 37 Hobe Sound MHP, Hobe Sound, Fla. 33455
Continuation-in-part of Ser. No. 60,410, Jan. 5, 1987, abandoned. This application May 1, 1989, Ser. No. 345,423
Int. Cl.[4] B65H *75/40*
U.S. Cl. 224—162 **4 Claims**

1. In combination with a walking cane having a generally straight elongate portion connected to a handle portion, an attachment device for holding said cane to a belt encircling a user of said cane wherein said device does not interfere with use of said cane and provides convenient means to retrieve said cane when dropped, said attachment device comprising:

(a) a spring-loaded reel including a retractable chain having a free end;
(b) a reel casing encasing said reel and having belt attaching means for attaching to said belt of said user;
(c) an elongate strap means having a long dimension great enough to encircle said straight elongate portion of said cane and having hook and loop fastening means for adjustably and releasably securing said strap means to said cane when so encircled;
(d) accessory strap means connected to said elongate strap



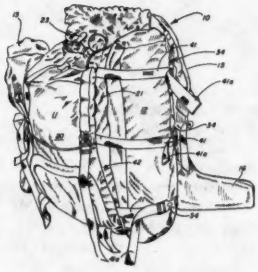
means, said accessory strap means having a connector-engaging means therein for engaging a connector;
(e) a connector attached to said free end of said chain, said connector removably connected to said connector-engaging means;
(f) an elastomeric "O" ring having an inside diameter less than the circumference of said straight portion of said cane, said "O" ring fitting snugly on said cane above said elongate strap means and engaging the upper edge of said elongate strap means to prevent said strap means from moving up said cane during use of said cane.

4,884,731

BACKPACK WITH DETACHABLE AUXILIARY PACKS

Paul T. Sibley, Boulder, Colo., assignor to Coleman Outdoor Products, Inc., Wichita, Kans.

Filed Jul. 1, 1988, Ser. No. 214,318
Int. Cl.[4] A45F *3/04*
U.S. Cl. 224—215 **5 Claims**



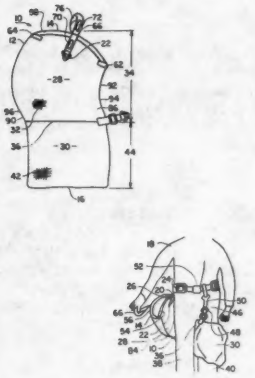
1. A backpack comprising: a main pack having a front portion, a back portion, and a pair of side portions; an auxiliary pack; a first fastener attached to one of said side portions of the main pack adjacent the front portion; a second fastener attached to said one side portion adjacent the back portion; a third fastener removably connected to said first fastener; a fourth fastener removably connected to said second fastener; first adjustable strap means for attaching one of the first and second fasteners to the main pack; second securing strap means for attaching said third and fourth fasteners to said auxiliary pack, whereby the auxiliary pack can be removably attached to the main pack; said first, second, third and fourth fasteners and said first and second strap means defining a, securing and adjusting means which extends from one of the side portions of the main pack adjacent the front portion, around a substantial portion of the auxiliary pack, and to one side portion of the main pack adjacent the back portion for adjusting the capacity of the auxiliary pack and connecting the auxiliary pack to the main pack.

4,884,732

GAME BAG FOR SCUBA DIVER

Howard f. Sunderland, 3939 Allin, Long Beach, Calif. 90803

Filed Sep. 14, 1988, Ser. No. 244,721
Int. Cl.[4] A45F *3/00*
U.S. Cl. 224—252 **16 Claims**



1. A game bag for a scuba diver, comprising:
a flexible tubular envelope having a selectively open end and a closed end;
a means for coupling the open end to the diver adjacent his hip;
the envelope further having:
a first predetermined length defining an insertion duct between the open end and a clamp position between the diver's legs allowing the envelope to be wrapped backwards around the diver's adjacent leg and between his two legs; and
a second predetermined length defining a receiver portion between the clamp position and the closed end; and
means for coupling the envelope adjacent the clamp position to the diver adjacent his front lower abdomen.

4,884,733

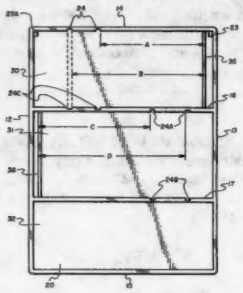
STORAGE CONTAINER FOR USE IN TRUNKS OF VEHICLES

Garry L. Geeves, 30927 Steeplechase Dr., San Juan Capistrano, Calif. 92675

Filed Jun. 27, 1988, Ser. No. 211,763
Int. Cl.[4] B60R *7/00*
U.S. Cl. 224—311 **7 Claims**

1. A storage container for use in storing material in a trunk of a vehicle comprising in combination a rectangular open top box from 10 to 12 inches in height and having a bottom, two sides and two shorter end members prepared from clear plastic

sheet, a first set of clear plastic divider members fixedly attached perpendicularly to the two sides and dividing the box into at least three separate compartments, the first and front compartment being from six to eight inches in width and capable of receiving a brief case, the second and third and other



compartments possessing adjustable sub-divider sheet members dividing each compartment into at least two subsection compartments, said sub-divider sheet members being perpendicular to the ends of the box, and a clear plastic sheet member removable top which covers all but the first front compartment of said box.

4,884,734

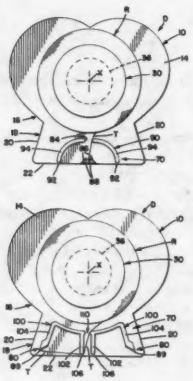
TAPE DISPENSER

John J. Kahl, Jr., Fairview Park; Brian A. Vulpitta, Avon Lake; Thomas A. Corbo, Gates Mills; Craig M. Saunders, Sagamore Hills, and John R. Nottingham, Moreland Hills, all of Ohio, assignors to Manco, Inc., Cleveland, Ohio

Filed May 8, 1987, Ser. No. 47,936

Int. Cl.[4] B26F *3/02*

U.S. Cl. 225—26 **17 Claims**



1. A tape dispenser adapted to hold a roll of tape comprising a generally planar vertical wall member having a front and a rear side;

tape roll holding means disposed at said rear side and adapted to permit said tape roll to unwind about an axis perpendicular to said wall member;

base means disposed vertically below said tape roll holding means and comprising a rearwardly extending member having a generally arcuate cross-section in a plane parallel to said wall member such that the arcuate extremities thereof form two parallel feet extending rearwardly from said wall member, said feet being adapted to support said tape dispenser in an upright free standing position; and

tape cutting means comprising a slot formed in said rearwardly extending member in a direction perpendicular to said wall member dividing said base member into two adjacent arcuate segments, said slot providing a passage through which an unwound length of said tape roll extends, a pair of cutting bars extending rearwardly from said front wall beneath said slot and being disposed on opposite sides of a plane passing through said slot, said cutting bars each having a tape cutting edge disposed opposite the other whereby said unwound length of said tape extends through said slot and between said cutting edges, with sufficient distance being provided between said segments of said base member and said cutting bars to permit a user's fingers to grasp said unwound length of said tape between said slot and said cutting bars.

4,884,735

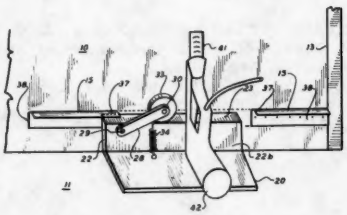
APPARATUS FOR INSTALLING STRIPING MATERIAL TO A WALL AT A UNIFORM DISTANCE ABOVE A FLOOR

Vincent Vulcano, 301 East 48th St., Apt 11G, New York, N.Y. 10017

Filed Aug. 26, 1988, Ser. No. 236,460

Int. Cl.[4] B27F *7/02*

U.S. Cl. 227—111 **28 Claims**



1. Apparatus for fastening a strip of capping material on the surface of a wall at a uniform distance from a floor joining said wall, said apparatus including:

(a) a base positionable on said floor and against said wall and movable along said floor while against said wall said base including a substantially planar member for sliding said base along said floor and an upright shoulder connected to and extending from said planar member, said shoulder having a top extending along the length thereof at a uniform distance above said planar member;

(b) a roller mounted on said base and over said top of said shoulder and biased against said top of said shoulder at a point along the length of said shoulder;

(c) a port in said shoulder proximate said top; and

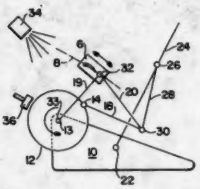
(d) mounting means coupled said base for mounting a capping material fastening means to said base and aligned with said port for fastening said capping material to said wall through said port at a uniform distance above said floor.

4,884,736

OSCILLATING MECHANISM

John Goddard, Bristol, England, assignor to Rolls Royce plc, London, England

Continuation-in-part of Ser. No. 174,899, Mar. 29, 1988, abandoned. This application Feb. 7, 1989, Ser. No. 307,055
Claims priority, application United Kingdom, Apr. 16, 1987, 8709286
Int. Cl.[4] B23K *20/12*
U.S. Cl. 228—2 6 Claims



1. A mechanism for oscillating an object along a path and for stopping the object at a predetermined point along the path, the mechanism comprising:

(a) an axially rotatable member mounted for rotation about an axis;

(b) a crank pin mounted eccentrically on the axially rotatable member with respect to said axis;

(c) a first link pivotably mounted at one end to the crank pin;

(d) a first pivot means fixed in relation to said axis;

(e) a second link mounted for pivotal movement about the first pivot means and adapted to carry the object along the arcuate path;

(f) a second pivot means located at an end of the first link opposed to the crank pin;

(g) a third pivot means located at an end of the second link distal to the first pivot means;

(h) a fourth pivot means fixed in relation to said axis and the first pivot means;

(i) an actuator lever pivotally connected at one end to the fourth pivot means;

(j) a fifth pivot means located on the actuator lever and distal from the fourth pivot;

(k) a third link pivotally connected at one end to the second pivot and at the other end to the third pivot;

(l) a fourth link pivotally mounted at one end to the second pivot means and at the other end to the fifth pivot means, the fourth link being of the same length as the third link;

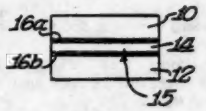
the actuator lever being rotatable about the fourth pivot means during the rotation of the axially rotatable member about its axis to a position where the locus of the fifth pivot means about the fourth pivot means intersects the locus of the third pivot means as the second link pivots about the first pivot means, thereby to stop the oscillation of the object along the arcuate path, characterised in that the locus of the second pivot means during the rotation of the axially rotatable member intersects the actuator lever and there is provided a timing means to time the movement of the actuator lever so as to cause the fifth pivot means to be aligned with the third pivot means when the second pivot means is coincident with the actuator lever.

4,884,737

METHOD FOR SURFACE BONDING OF CERAMIC BODIES

Marc S. Newkirk; Robert C. Kantner, both of Newark, and Eugene S. Park, Hockessin, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed May 21, 1987, Ser. No. 53,215
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—121 16 Claims



1. A method of bonding ceramic bodies to each other along substantially congruent surfaces, comprising:

(a) positioning a first cermic body and a second ceramic body adjacent to each other with a surface of said first body facing a surface of said second body to define a bonding zone therebetween;

(b) orienting a body of precursor metal relative to said bonding zone so that an oxidation reaction product obtained from said precursor metal in step (c) below is formed in said bonding zone;

(c) heating the resultant assembly of said ceramic bodies and said body of precursor metal in the presence of a vapor-phase oxidant to a temperature region above the melting point of said precursor metal and below the melting point of said oxidation reaction product to provide a body of molten precursor metal; and

(d) in said temperature region,

(i) reacting said vapor-phase oxidant with said molten precursor metal to form said oxidation reaction product; p2 (ii) maintaining at least a portion of said oxidation reaction product in contact with and between said molten precursor metal and said oxidant, to progressively draw molten precursor metal from said body through the oxidation reaction product and into said bonding zone; and

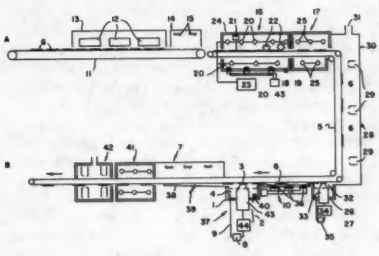
(iii) continuing such reacting for a time sufficient to bridge said bonding zone with said oxidation reaction product and thereby bond said surfaces to each other.

4,884,738

METHOD AND APPARATUS FOR BRAZING SURFACE COMPONENTS ONTO A PRINTED CIRCUIT BOARD

Francis Bourrieres, Le Carreyat, 82000 Montauban, France

Continuation-in-part of Ser. No. 42,652, Apr. 28, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,419
Claims priority, application France, Apr. 28, 1986, 8606236
Int. Cl.[4] B23K *1/00, 31/02;* H05K *3/34*
U.S. Cl. 228—180.2 6 Claims



1. In a method for brazing surface components onto a circuit

board including the steps of applying a brazing cream comprising microballs of brazing alloy bound by a flux to define a pasty consistency to locations on the board where brazing is to be effectuated, positioning the surface components on the board, increasing the temperature of the board to a temperature higher than the melting temperature of the brazing alloy, and cooling the circuit board to solidify the brazes,

the improvement which comprises

treating the board to decontaminate the surfaces of the board and the microballs to eliminate the microballs formed during brazing, said treating steps including

(a) contacting the board with a superfusing liquid, the surface of the board bearing the components being directed downwardly.

(b) raising the temperature of the liquid higher than the melting point of the brazing alloy comprising the brazes and the microballs to be eliminated;

(c) controlling the liquid contact time to completely melt the microballs and to superficially melt the brazes while eliminating forces within the superfusing liquid parallel to the surface of the board sufficient to displace the components when the brazes are melted.

4,884,739

CONTAINER FOR PRODUCE AND THE LIKE

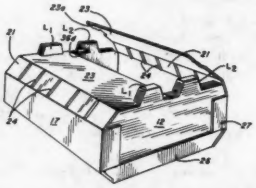
Terrill L. Nederveld, Ada, Mich., assignor to Packaging Corporation of America, Evanston, Ill.

Continuation-in-part of Ser. No. 823,679, Jan. 29, 1986, Pat. No. 4,645,122. This application Sep. 29, 1986, Ser. No. 913,599

The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.

Int. Cl.[4] B65D *5/32*

U.S. Cl. 229—109 **7 Claims**



1. A container for produce and the like which is adapted to be arranged in stacked relation with a second container of like configuration, said container comprising a central section having a bottom panel, upright side panels arranged in opposed spaced relation, top closure panels, first joiner panels interconnecting the bottom and the side panels and being angularly disposed relative to said bottom and side panels, and second joiner panels interconnecting the side panels to corresponding top closure panels and being angularly disposed relative to said top closure and side panels, and a pair of rigid upright end sections disposed in opposed relation and fixedly secured to predetermined portions of said central section, said central section and said end sections coacting to form a receptacle for accommodating the produce, each end section having upwardly protruding means formed on an upper edge portion thereof for interlocking with a corresponding top closure panel and retaining the latter in a predetermined folded position relative to said side panel, when the top closure panels are in said folded portions, the second joiner panels of the central section engage corresponding edge portions of said end sections; each end section having recess means formed on a lower edge portion thereof and in substantially vertical alignment with the protruding means formed on the upper edge portion of said end section, and means angularly disposed relative to said central section bottom panel for partitioning said recess means from the receptacle and shielding the accommodated produce from the protruding means of the second container stacked therebeneath and when the latter protruding means are disposed within corresponding recess means of the container stacked thereabove.

4,884,740

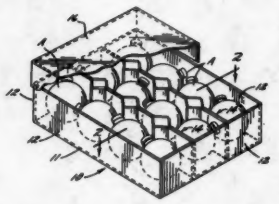
FIBERBOARD DIVIDER FOR SHIPPING CARTONS

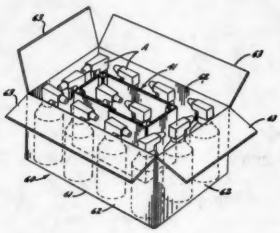
Glenn D. Ross, Smyrna, Ga., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Jun. 27, 1988, Ser. No. 211,595

Int. Cl.[4] B65D *5/48*

U.S. Cl. 229—120.26 **16 Claims**





1. A divider adapted for use as an internal partition in a shipping carton or the like and so as to impart substantial vertical stacking strength to the carton, and comprising

a pair of rectangular solid fiberboard panels each having inner and outer faces, a longitudinal length direction, and a transverse width direction, with each panel including at least two longitudinally separated outer portions and a medial portion defining the longitudinal separation between each adjacent pair of outer portions;

said panels being disposed in an overlying contiguous relationship with said inner faces being opposed to each other and said outer portions and medial portions of said panels being respectively aligned, and with each of the outer portions of each panel being adhesively secured to the opposing outer portion of the other panel;

said panels having at least six parallel cut score lines positioned at each medial portion and extending transversely the full width dimension of the panel, with a first two of said cut score lines being on the outer face of respective ones of said panels and disposed in the vicinity of the longitudinal center of the intermediate medial portion, a second two of said cut score lines being located on the inner face of one of said panels and adjacent respective ones of the junctures of said medial portion and said outer portions and a third two of said cut score lines being located on the inner face of the other of said panels and adjacent respective ones of the junctures of the associated medial portion and said outer portions of the other panel;

whereby each of the medial portions of said two panels may be separated to form a transversely extending support column which is generally rectangular in cross section and with said outer portions of said panels being generally coplanar and extending along a plane which extends be-

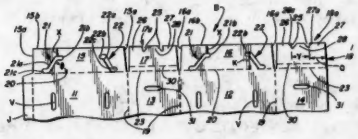
tween opposite corners of each thereby formed support column.

4,884,741

SHIPPING CONTAINER AND BLANK THEREFOR

Terrill L. Nederveld, Ada, Mich., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Apr. 14, 1988, Ser. No. 181,660
Int. Cl.[4] B65O *5/10*
U.S. Cl. 229—157 **9 Claims**



1. A shipping container comprising a pair of opposed upright first panels; a pair of opposed upright second panels angularly disposed relative to said first panels, adjacent first peripheral portions of said first and second panels being interconnected by first foldlines and defining upright corners; first closure flaps connected by second foldlines to corresponding second peripheral portions of said first panels and extending angularly therefrom towards one another in a closing mode; and second closure flaps connected by third foldlines to corresponding second peripheral portions of said second panels and extending angularly therefrom towards one another when in a closing mode whereby said second flaps at least partially overlap exterior surfaces of said first closure flaps and lockingly cooperate therewith to form a closure; each first closure flap being provided with a pair of relatively spaced locking slots, each slot being spaced a first predetermined distance from an adjacent upright corner and including an elongate first segment extending at an acute angle away from an adjacent second panel and a second segment obliquely disposed relative to an end of said first segment and spaced a predetermined distance from one of the second foldlines; the slot second segments formed in each first closure flap extending from the first segments towards one another, each second closure flap having means formed in a peripheral segment thereof opposite the third foldline, said means defining said peripheral segment into a pair of relatively spaced outer tabs, the latter being simultaneously inserted into the corresponding locking slots formed in said first flaps; each outer tab having a peripheral portion thereof disposed within a second segment of the corresponding slot.

4,884,742

FLAT TIP FOR CUP GUNS

Wayne Bekius, Milaca, and John Svendsen, Corcoran, both of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

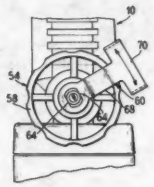
Filed Aug. 16, 1988, Ser. No. 232,950
Int. Cl.[4] B05B *15/08*
U.S. Cl. 239—71 **12 Claims**

1. A nozzle assembly for being received on an end of spray gun comprising:

a nozzle guard member having a through passage, one end of said nozzle guard member being engagingly matable with said end of said spray gun and an opposite end of said nozzle guard member including an opening to said passage;

a nozzle member, including a non-circular orifice, having a generally cylindrical body sized to be rotatingly held within said opening in said nozzle guard member, said cylindrical body having a length sufficient so as to project beyond said opening; and

an actuating lever having a first end which engages said nozzle member where it projects beyond said opening, and a second end which comprises a manual engagement area graspable by a user, such that said nozzle orifice can



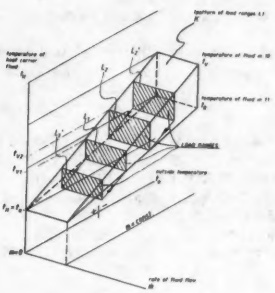
be rotated within said nozzle guard member upon rotation of said actuating lever.

4,884,743

METHOD OF AND PLANT FOR REGULATING THE TEMPERATURE OF A HEAT CARRIER FLUID

Thomas Baehr, Hirtenweg 11a, D-3000 Hannover 1, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 171,479
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3709085
Int. Cl.[4] F24D *3/02*; G05D *23/00*
U.S. Cl. 237—8 R **13 Claims**



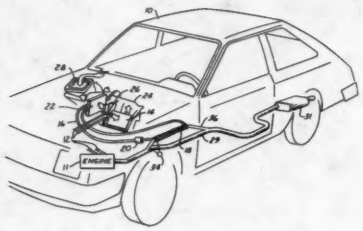
1. A method of regulating the characteristics of a heat carrier fluid which flows from a heat quantity influencing unit to at least one heat exchanger and back to the heat quantity influencing unit in a temperature regulating plant, comprising the steps of establishing a three-dimensional pattern which is characteristic of the plant and represents load range as a function of external temperature where load range is a rectangular area bounded by two sides of length $(tV-t_R)$ and two sides of length m, t_V and t_R respectively denoting the temperature of fluid flowing to and from the at least one heat exchanger and m being the rate of fluid flow through the at least one heat exchanger; ascertaining an actual load range for the plant by determining the product $(t_{V-tR})\times m$ for the fluid flowing to and from the at least one heat exchanger; comparing the actual load range with the load ranges of the pattern; and altering the value of t_V of the fluid flowing toward the at least one heat exchanger when the actual load range deviates from the pattern.

4,884,744

AUTOMOTIVE HEATING SYSTEM WITH MULTIPLE INDEPENDENT HEAT SOURCES

Arvind J. Padgaonkar, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 20, 1987, Ser. No. 5,067
Int. Cl.[4] B60H *1/02*
U.S. Cl. 237—12.3 R **1 Claim**



1. A heating system for the passenger compartment of a motor vehicle with an air breathing, fuel burning engine, comprising:

a first heat exchanger for receiving heat from coolant circulating through said engine;

a second heat exchanger supplied with heat by a third heat exchanger and heat transfer system operatively associated with and receiving heat from a heat source of said engine other than said coolant, with said heat exchanger and heat transfer system comprising a third heat exchanger for receiving and transferring heat, from compressed air flowing from a turbocharger associated with said engine to the air intake of said engine, to a heat transfer fluid circulated from said third heat exchanger to said second heat exchanger;

a case for containing said first and second heat exchangers; and

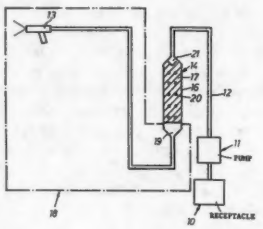
a fan for circulating air serially through said first and second heat exchangers and into said passenger compartment.

4,884,745

METHOD AND APPARATUS FOR INSULATING A SPRAY LIQUID SOURCE FROM HIGH VOLTAGE OF AN ELECTROSTATIC SPRAY GUN

Rolf T. Spongh, Tyresö , Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 12, 1987, Ser. No. 25,018
Claims priority, application Sweden, Mar. 17, 1986, 8601229-1
Int. Cl.[4] B05B *5/02*
U.S. Cl. 239—3 **20 Claims**



1. In an electrostatic spray gun, a method for insulating a spray liquid source from a high tension voltage of the electrostatic spray gun when using an electrically conductive spray liquid supplied from the spray liquid source, comprising:

supplying an electrically conductive spray liquid to the electrostatic spray gun via a spray liquid supply line means from the spray liquid source:

providing in the spray liquid supply line means a volume of a barrier forming liquid which possesses a property of not being mixable with the spray liquid, said barrier forming liquid having a low electrical conductivity and said barrier forming liquid having a low electrical conductivity and a density different from that of the spray liquid;

disintegrating the spray liquid into a great number of small quantities within said barrier forming liquid; and

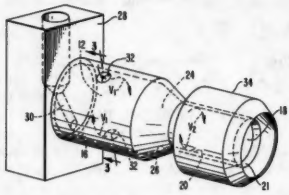
permitting said great number of spray liquid quantities to be transported continuously through said barrier forming liquid by the influence of the difference in gravity acting on said two liquids.

4,884,746

FUEL NOZZLE AND IMPROVED SYSTEM AND METHOD FOR INJECTING FUEL INTO A GAS TURBINE ENGINE

George D. Lewis, Kodak, Tenn., assignor to Radial Turbine International A/S, Kongsberg, Norway

Filed Feb. 5, 1987, Ser. No. 11,312
Int. Cl.[4] B05B *7/10*
U.S. Cl. 239—5 **10 Claims**



8. A method for providing fine fuel droplet sizes in the fuel spray from a turbine engine fuel nozzle assembly at relatively low fuel flow rates through the nozzle and at relatively low pressure differentials across the nozzle, the method comprising the steps of:

impinging the fuel directly onto an internal wall surface of a first cylindrical swirl chamber of the nozzle assembly;

introducing air into the first swirl chamber, downstream of the impinging fuel, in a substantially tangential flow path around the internal wall surface of the first swirl chamber to cause said fuel to lie on said internal wall surface in a substantially smooth film and swirl circumferentially about the first swirl chamber in substantially the same direction as the air flow therein;

increasing the tangential velocity of the swirling air and fuel film in an exit chamber operatively connected to the first swirl chamber;

directing air swirling in a second swirl chamber into close association with the increased tangential velocity swirling air and fuel film exiting the exit chamber to thereby break-up said swirling fuel film into a fuel spray having fine droplets and a predetermined spray angle.

4,884,747

RIPPLE-FREE FLOW, ACCURATE MIX, AND AUTOMATED SPRAY SYSTEM

Max J. Dykmans, 1214 Pioneer Way, El Cajon, Calif. 92022-0696

Filed May 14, 1987, Ser. No. 50,317
Int. Cl.[4] B05B *7/04, 3/00;* **F04B** *35/00*
U.S. Cl. 239—61 **20 Claims**

9. An apparatus utilizing a plurality of pump assemblies for use in the construction of composite tanks for applying mate-

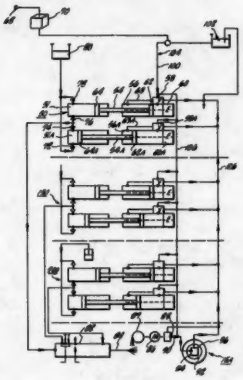
rial to a surface through an outlet, each pump assembly comprising:

i. a pressurized input supply line and a return supply line;

ii. a first hydraulic cylinder having a first hydraulic piston and having a first control means controlling the flow to one side of the first hydraulic piston from said pressurized input supply line and controlling the flow from the other side of the first hydraulic piston to a return supply line,

iii. a first supply cylinder having a first supply piston connected to said first hydraulic piston, said first supply cylinder having at least one inlet check valve and at least one outlet check valve,

iv. a second hydraulic cylinder having a second hydraulic piston and having a second control means controlling the flow to one side of the second hydraulic piston from a central pressurized supply line and controlling the flow from the other side of the second hydraulic piston to a return supply line,



v. a second supply cylinder having a second supply piston, connected to the second hydraulic piston, said second supply cylinder having at least one inlet check valve and at least one outlet check valve,

vi. means for independently sensing and controlling the movement of the first and second hydraulic pistons so that the first piston starts to move from a position of zero velocity when the second piston starts to decline to a position of zero velocity and when the first piston reaches maximum velocity, the second piston reaches zero velocity, resulting in a continuous substantial ripple-free combined flow from the supply cylinders;

wherein the means for independently sensing and controlling the movement of the first and second hydraulic pistons include an encoder positioned to sense piston location and velocity, a computer receiving the output of said encoder and a servo valve communicating with said first and second hydraulic pistons and said computer and operatively coupled with said pistons.

4,884,748

FAIRING FLAP ARRANGEMENT

Eric J. Ward, W. Palm Beach; Kevin L. Worley, Palm Beach Gardens, and Kenneth M. Pesyna, Royal Palm Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 2, 1988, Ser. No. 239,738
Int. Cl.[4] B63H *11/10*
U.S. Cl. 239—265.37 **5 Claims**

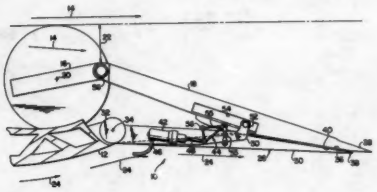
1. An external fairing arrangement extending between a static air frame and a downstream end of a movable, gas directing control flap, comprising

a generally planar fairing flap, including

an upstream leading edge and a downstream trailing edge,

a supporting hinge, secured to the static airframe and extending transversely with respect to an external airframe airflow, said hinge being coincident with the leading edge of the fairing flap,

a first rubstrip, disposed adjacent the trailing edge of the fairing flap;



a second rubstrip, disposed adjacent the downstream end of the control flap and oriented to contact the first rubstrip; and

means for continually urging the fairing flap rotationally about the supporting hinge and into contact with the control flap at the first and second rubstrips,

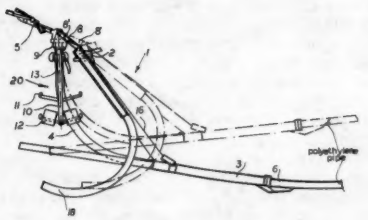
wherein the control flap is supported by a second hinge joint disposed along an upstream edge thereof, the control flap being positioned by a drive arm having a roller member received within a cam race disposed in the control flap.

4,884,749

SPRINKLER STAND, PARTICULARLY FOR NONLEVEL GROUND

Adam Ruprechter, Voitsberg, Austria, assignor to Fa. Rohren- und Pumpenwerk Rudolf Bauer Aktiengesellschaft, Voitsberg, Austria

Filed Jun. 24, 1988, Ser. No. 211,204
Claims priority, application Austria, Jun. 26, 1987, 1629/87
Int. Cl.[4] B05B *15/06*
U.S. Cl. 239—280.5 **9 Claims**

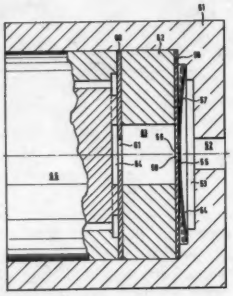


1. A sprinkler stand for supporting or carrying a sprinkler comprising an swingable mount carrying said sprinkler and pivotally mounted in said sprinkler stand, said sprinkler being attached to a flexible water feed hose, and said swingable mount being provided with a balancing device having a plurality of variable size weights directed downwardly, said swingable mount being mounted to pivot about a substantially horizontal pivot axis which is substantially perpendicular to a longitudinal axis of said sprinkler stand, said swingable mount comprising a support plate on which said sprinkler is mounted and two pivot arms connected to said support plate in the vicinity of the ends of said support plate directed upwardly for pivotal suspension in said sprinkler stand.

4,884,750
THRUST REGULATOR COMPRISING A MOUNTING ENCLOSURE

Winfried Werding, General Guisan 77, Pully, Switzerland (CH-1009)

PCT No. PCT/CH86/00103, § 371 Date Mar. 20, 1987, § 102(e) Date Mar. 20, 1987, PCT Pub. No. WO87/00513, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 22, 1986, Ser. No. 44,495
Claims priority, application Switzerland, Jul. 23, 1985, 3286/85; Nov. 15, 1985, 4895/85
Int. Cl.[4] B05B *1/34, 1/30*
U.S. Cl. 239—337 13 Claims



1. A thrust regulator for dispensing a liquid at a substantially constant flow rate from a container containing said liquid and a compressed gas, said thrust regulator comprising

a mounting enclosure having a first end and a second end, said first end having a supply duct formed therein, said supply duct connectable to a container containing a liquid and a compressed gas, said second end having an opening therein, said opening being receivable of a nozzle therein, said mounting enclosure and said nozzle, when received in said opening, defining a chamber intermediate said nozzle and said supply duct;

first pressure-responsive flow control means, disposed in said chamber and fluidically connected to said supply duct, for inhibiting liquid flow through said supply duct in a manner substantially inversely proportional to the pressure of said compressed gas in said container;

flow retarding means, disposed in said chamber and fluidically connecting said nozzle and said first pressure-responsive flow control means, for retarding liquid flow from said first pressure-responsive flow control means to said nozzle in a manner substantially inversely proportional to the pressure of liquid exiting said first pressure-responsive flow control means;

said first pressure-responsive flow control means and said flow retarding means cooperating to maintain a substantially constant liquid flow rate through said nozzle substantially independent of the pressure of said compressed gas.

4,884,751
LAWN SPRINKLER

Edgar E. Pettit, Houston, Tex., assignor to Lil' Duke Sprinkler, Inc., Houston, Tex.

Filed Apr. 13, 1988, Ser. No. 181,321
Int. Cl.[4] B05B *1/34*
U.S. Cl. 239—468 1 Claim

1. A lawn sprinkler comprising

a substantially flat base of molded plastic,

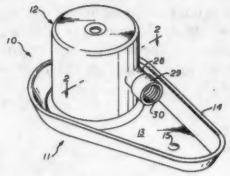
a one-piece hollow plastic, inverted cup-shaped housing supported on said base,

an inlet pipe molded integrally with said housing and having a fixed female threaded fitting for connection to a garden hose at the inlet end thereof,

said inlet pipe opening tangentially into the interior of said housing with the opening flush with the inner surface thereof and molded as a single piece therewith with no portion thereof extending inside said housing,

said cup-shaped housing having cylindrical side walls, an open bottom end, and a flat top wall with curved peripheral internal top edge,

said top wall having an externally beveled central spray opening which is small at the inside and tapers outwardly at the top surface of said top wall,



said flat base having a groove molded in the upper surface thereof,

said cup-shaped housing having said open bottom end fitted into and cemented in place in said groove,

the upper surface of said flat base having a locating recess therein,

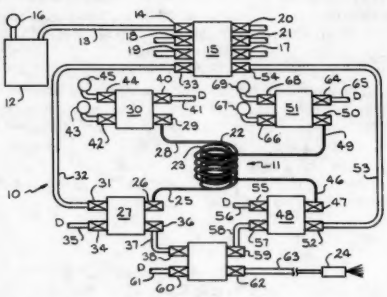
the edge of said housing having a projection which fits said recess in the base to orient the housing thereon, and

the edge of said housing having a peripheral groove along substantially the entire length thereof which forms an annular cavity with the bottom wall of said groove which receives and confines the cement used to secure the housing to the sprinkler base.

4,884,752
ELECTROSTATIC PAINT SPRAY SYSTEM WITH DUAL VOLTAGE ISOLATING PAINT RESERVOIRS

Raymond G. Plummer, Toledo, Ohio, assignor to The De31ilbiss Company, Toledo, Ohio

Continuation-in-part of Ser. No. 122,312, Nov. 18, 1987, Pat. No. 4,792,092. This application Dec. 13, 1988, Ser. No. 283,871
Int. Cl.[4] B05B *5/02, 15/02*
U.S. Cl. 239—691 3 Claims



1. An electrostatic paint spray system including dual voltage isolating paint reservoirs comprising an electrically grounded source of different color paint and solvent, an electrostatic paint spray gun, first and second electrically insulated tubes, each of said tubes forming a separate paint reservoir electrically isolated from the other paint reservoir, each of said tubes winding about an axis to form a helix, said second tube forming

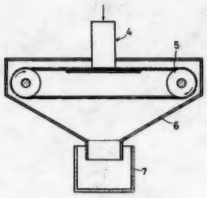
a helix having an outer diameter less than the inner diameter of said first tube, said second tube helix extending within said first tube helix, means for selectively supplying paint and solvent from said source to said first and second tubes, and means for selectively delivering paint from one of said first and second tubes to said spray gun while the outer of said first and second tubes is cleaned with solvent and charged with paint from said source.

4,884,753

PULVERIZING METHOD

Toshiya Maki, 725-1, Funaho, Funaho-cho, Asakuchi-gun, Okayama, Japan

Filed Nov. 22, 1988, Ser. No. 275,564
Int. Cl.[4] B02C *19/12, 23/18*
U.S. Cl. 241—3 8 Claims



1. A method of pulverizing a material, said method comprising the steps of:

providing a tube made of liquid frozen into a tubular shape;

packing a material to be pulverized into said tube made of said liquid; and

grinding said tube and said material to be pulverized packed therein by grinding from one end of said tube.

4,884,754

PROCESS FOR PRODUCING FINE COPPER FLAKES

Preston B. Kemp, Jr., Troy, N.Y., and Walter A. Johnson, Houghton, Mich., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 3, 1989, Ser. No. 292,788
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—5 5 Claims

1. A process for producing fine copper flakes, said process comprising:

(a) media milling copper powder particles with one or more organic surfactants in a non-polar organic medium to comminute said copper particles and produce intermediate flakes having a thickness of less than about 3 micrometers;

(b) removing the major portion of said organic medium and said organic surfactants from said intermediate flakes to produce dried intermediate flakes; and

(c) fluid energy milling said intermediate flakes to reduce the diameter of said dried intermediate flakes and produce flakes having a diameter of no greater than about 10 micrometers in diameter.

4,884,755

FOOD PROCESSOR

James A. Hedrington, Chippewa Falls, Wis., assignor to Presto Industries, Inc., Eau Claire, Wis.

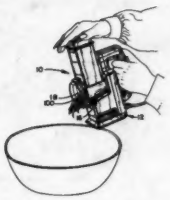
Filed Aug. 30, 1988, Ser. No. 238,325
Int. Cl.[4] A47J *43/25*
U.S. Cl. 241—37.5 23 Claims

1. A portable hand-held food processor comprising:

a first housing that is generally L-shaped and has a handle portion and a base portion with a support member at its outer extremity;

a second housing adapted to be releasably attached to said first housing, said second housing having a first opening into which food products are placed, a second opening for the discharge of processed food products and first support means adapted to cooperate with said support member for supporting said second housing on said base portion;

a cutting member removably and rotatably mounted in said second housing, said cutting member having a hollow interior, a plurality of cutting blades disposed circumferentially about its rotational axis, openings through which processed food items pass into said interior, and a discharge end having an opening aligned with said second opening on said second housing;



means on said second housing for supporting said cutting member at its discharge end;

means mounted in said first housing for driving said cutting member;

means for connecting said driving means to said cutting member;

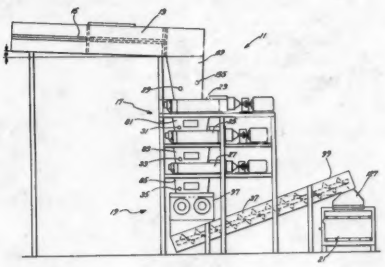
means for locking said second housing in position attached to said first housing.

4,884,756

WASTE TREATMENT SYSTEM

Erich H. Pearson, 925 Oakwood Ct., Glen Ellyn, Ill. 60137

Filed Feb. 1, 1989, Ser. No. 305,473
Int. Cl.[4] B02C *23/38*
U.S. Cl. 241—42 11 Claims



1. A contaminated waste treatment system for treating contaminated waste, comprising:

batch input means for receiving the contaminated waste;

disintegrator means connected to said input means and for reducing the contaminated waste into small pieces;

decontamination means including: (1) mixing means disposed in a position to receive contaminated waste from said disintegrator means and rotatable for transferring said waste to a discharge position; (2) a conduit surrounding said mixing means; and (3) a disinfectant fluid housed in said conduit and surrounding a portion of said mixing means, said mixing means transferring the contaminated

waste through said fluid at a predetermined rate for decontaminating the waste.

4,884,757

FEEDER FOR A FIELD CROP CHOPPER

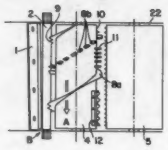
Josef Streicher, Blumenstrasse 5, D-9029 Sauerlach-Lochhofen, Fed. Rep. of Germany

Continuation of Ser. No. 36,071, Apr. 9, 1987, abandoned. This application Oct. 24, 1988, Ser. No. 262,085

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1986, 3612660

Int. Cl.[4] B02C *18/22*

U.S. Cl. 241—222 12 Claims



1. In a feeder device for a chopper having a stationary mating knife, at least one chopping knife arranged at a cutting angle to the mating knife so as to provide a drawing cut commencing at a given part of the mating knife, and draw-in means whose feed direction is generally perpendicular to the mating and cutting knives, the draw-in means including at least one draw-in roll being supported directly in front of the mating knife and having a longitudinal axis of rotation extending generally parallel thereto, wherein the improvement comprises a feed means extending over the total length of the at least one draw-in roll along the length of the roll in the direction of said axis of rotation which imparts a feed direction component along said axis of rotation of the at least one draw-in roll and towards the given part of the mating knife at which the cut commences.

4,884,758

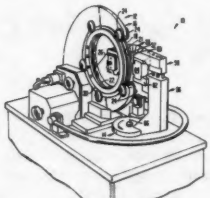
SELF-LOADING WIRE WINDING ASSEMBLY AND METHOD

Clark J. Hamkins, Lexington, Ky., assignor to Kuhlman Corporation, Troy, Mich.

Continuation of Ser. No. 48,523, May 6, 1987, Pat. No. 4,771,957, which is a continuation of Ser. No. 698,981, Feb. 6, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 132,091

Int. Cl.[4] H01F *41/06*

U.S. Cl. 242—4 BE 18 Claims



1. A self-loading wire winding assembly, for use with a mandrel, a mandrel support, a wire supply and a coil winding machine having a frame and a shuttle drive, the mandrel supported by the mandrel support, for winding wire from the wire supply around the mandrel so to create a coil segment of wire on the mandrel, the winding assembly comprising:

a circumferential cage, mounted to the frame, having a radially outward, inwardly facing first surface;

a circumferential winding magazine, freely rotatably mounted within the cage, having a radially inward, outwardly facing second surface, the first and second surfaces defining a cavity therebetween, the magazine having an interior within which the mandrel can move; and

a winding shuttle, drivenly coupled to the shuttle drive for movement within the cavity and around the second surface in first and second rotary directions, the winding shuttle configured for winding wire housed within the cavity onto the mandrel as the shuttle rotates around the mandrel, the first and second surfaces sized so that a reverse loop of wire can be accommodated between them and wherein the sole rotational force on the magazine is the pull of the wire caused by rotation of the winding shuttle.

4,884,759

WINDING APPARATUS

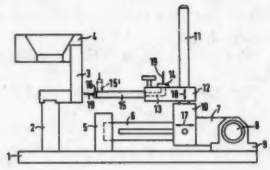
Friedrich Nelle, Stuttgart; Heinz Lehner, Oberschneiding, and Klaus Nitzsche, Straubing, all of Fed. Rep. of Germany, assignors to Nokia Graetz, Pforzheim, Fed. Rep. of Germany

Continuation of Ser. No. 109,074, Oct. 16, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 331,005

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3635220

Int. Cl.[4] B21F *3/10*; H01F *7/20, 41/04*

U.S. Cl. 242—7.14 4 Claims



1. An apparatus for winding saddle coils on a coil form having a central axis and preformed grooves in which said coil is to be wound, said grooves being formed in both interior and exterior surfaces of said coil form, a portion of said grooves not lying in planes passing through the central axis, said apparatus comprising:

a device for supporting the coil form;

means for rotating said device about the central axis of the coil form;

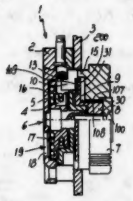
a wire guide tube having a wire outlet; and

means for linearly moving said guide tube in three directions orthogonal to each other, one of said directions being parallel to the central axis of the coil form, and for operating in co-operation with the means for rotating said device so that the wire outlet moves along paths defined by said grooves, whereby any point in a space defined by the maximum linear movement of the wire outlet of the guide tube can be reached by the wire outlet, and the wire outlet is positionable adjacent to the coil form and movable along the contour of turns to be wound in the grooves of the coil form.

4,884,760
LOCKING AND ADJUSTMENT DEVICE PARTICULARLY FOR SKI BOOTS

Giorgio Baggio, San Martino di Lupari, and Mirko Baratto, Bigolino di Valdobbiadene, both of Italy, assignors to Nordica S.P.A., Montebelluna TV, Italy

Filed Dec. 28, 1987, Ser. No. 138,902
Claims priority, application Italy, May 15, 1987, 82550 A/87
Int. Cl.[4] A43B *5/04*; A43L *11/00*; B65H *75/48*
U.S. Cl. 242—54 R **15 Claims**



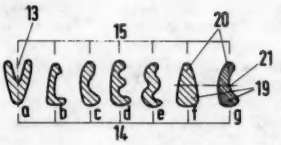
1. Locking and adjustment device particularly for ski boots comprising:
- a box-like body,
- at least one cable,
- winding means rotatably accommodated in said box-like body
- ratchet gear means mounted on said box-like body and being moveable from a first position whereat said ratchet means interfere with said winding means to permit rotation thereof in a cable winding direction, to a second position whereat said ratchet means do not interfere with said winding means to permit rotation thereof in a cable unwinding direction,
- at least one actuating member rotatably connected to said winding means externally of said box-like body,
- means for rotatively engaging said actutating member with said winding means,
- at least one actuation formation rigidly associated with said actuating member, and
- means for converting said rotational movement of said actuating member into translatory movement of said actuation formation for moving said actuation formation into engagement with and away from said ratchet gear means for moving said ratchet gear means between said first position and said second position.

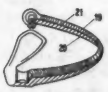
4,884,761
LINE BAIL, AS WELL AS THE ASSOCIATED FISHING REEL

Rupert Kuntze, Kudowastrasse 9, 1000 Berlin 33 (West), Fed. Rep. of Germany

Filed Feb. 13, 1987, Ser. No. 14,488
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 3604700
Int. Cl.[4] A01K *89/01*
U.S. Cl. 242—235 **9 Claims**

1. Line bail for a fishing reel having a longitudinal axis and a reel part rotatable about the longitudinal axis, said line bail is pivotally mounted on said reel part for pivotal movement about a pivot axis extending transversely of the longitudinal axis, wherein the improvement comprises that the line bail (6) is formed completely of a plastics material, said line bail has a first end and a second end each pivotally mounted on said reel part with a bail part extending between said first and second ends generally in the direction of the pivot axis, said bail part has an oblong cross-section between said first and second ends thereof and the cross-section is elongated in the direction transverse to the pivot axis of said line bail and the oblong crosssection has a first end surface and a second end surface spaced apart by side surfaces in the elongated direction, said first and second end surfaces being narrow as compared with said side surfaces extending between the first and second end surfaces, said bail being pivotally displaceable between a release position and a lien capturing position for a fishing line on said fishing reel with the fishing line gliding over the first end surface in the pivotal movement between the release position



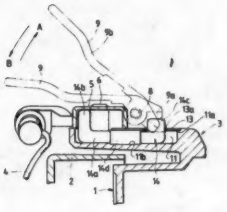


and the capturing position, said second end surface having a rounded shape and, said first end surface being rounded and having a radius of curvature greater than said second end surface and said first end surface being wider than said second end surface, and at least said first end surface being formed of a smooth surfaced wear resistant plastics material.

4,884,762
BAIL ARM TURNING MECHANISM FOR SPINNING REEL

Kikuo Tunoda, Fuchu, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Nov. 16, 1988, Ser. No. 271,783
Claims priority, application Japan, Nov. 30, 1987, 62-183101[U]
Int. Cl.[4] A01K *89/00*
U.S. Cl. 242—236 **8 Claims**



1. In a bail arm turning mechanism in a spinning reel which includes a rotor: a spool having a spool axis; first and second ears carried by said rotor and positioned at diametrically opposite side of said rotor and extending toward said spool, said first ear having a radially outward side portion extending radially

outwardly with respect to said spool axis; a bail arm lever rotatably supported to said first ear about a first axis; a bail arm cam rotatably supported to said second ear; a bail arm having one end pivotally supported to said bail arm lever and another end pivotally supported to said bail arm cam; and a dead point spring disposed to selectively bias said bail arm cam toward a fishing line rewinding position and a releasing position to thus provide these two positions of said bail arm; the improvement comprising;

a manual operation lever (**9**) pivotally supported to said radially outward side portion of said first ear (**3**), said manual operation lever having a front manupulation portion (**9***b*), a pivot portion and a rear portion having a second axis (**9***a*), and said manupulation portion being pivotable between radially outward and radially inward positions;

a restoration means (**10**) connected to said manual operation lever to bias the same toward said radially inward position;

said first ear (**3**) being formed with a recessed portion (**11**) which has a radially outwardly facing open end; and

a rotational lever (**14**) disposed in said recessed portion (**11**), said rotational lever (**14**) having a main elongated portion (**14***a*) having front and rear ends and a central axis in parallel with said spool, a front boss portion (**14***b*) extending from said front end of said main elongated portion, and a rear boss portion (**14***c*) extending from said rear end of said main elongated portion, said front boss portion (**14***b*) being engageable with said bail arm lever (**5**), and said rear boss portion (**14***c*) being in abutment with said rear portion (**9***a*) of said manual operation lever (**9**), said rotational lever (**14**) being rotatable about said central axis upon said rear portion (**9***a*) urging said rear boss portion (**14***c*) in response to said lower position of said manual operation lever wherein the first, second, and central axes are mutually orthongonal.

4,884,763

THREAD SIGNAL EMITTER

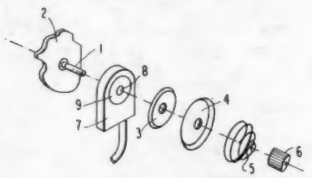
Sten A. O. Rydborn, Klöxhultsvägen 21, 343 00 Älmhult, Sweden

Filed May 18, 1988, Ser. No. 195,587

Claims priority, application Sweden, May 27, 1987, 8702223

Int. Cl.[4] **B65H** *59/20, 63/02*

U.S. Cl. 242—148 **7 Claims**



1. An apparatus for sensing thread movement, generating an electric signal corresponding to thread movement, and indicating at least signal loss and, thereby, cessation of thread movement in a thread brake in textile machines, said apparatus comprising:

a brake element adapted to contact the thread to apply braking force thereto;

transducer means for sensing movement of the thread during application of braking force to the thread by the brake element and providing an electric signal representative of a sensed movement, the transducer means having a piezoelectric element in contact with the brake element, said piezoelectric element being disposed on a circuit board with components of said transducer means for generating the electric signal in response to the thread movements; and

means for applying the signal to a monitoring circuit adapted to provide an indication of whether the signal is present or absent during a period of time when the signal should be present.

4,884,764

YARN WINDING MACHINE

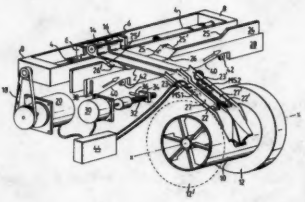
Grenville M. Hill, Greenisland, Northern Ireland, assignor to James Mackie & Sons Limited, United Kingdom

Continuation of Ser. No. 62,179, Jun. 12, 1987, abandoned. This application Aug. 24, 1988, Ser. No. 238,986

Claims priority, application United Kingdom, Jun. 16, 1986, 8614605

Int. Cl.[4] **B65H** *54/28*

U.S. Cl. 242—158 R **15 Claims**



1. A yarn package traverse mechanism for a yarn winding machine, for winding a yarn package onto a bobbin having spaced-apart flanges, said mechanism comprising,

a rotatable bobbin mount comprising a spindle for receiving said flanged bobbin, said spindle having an axis of rotation,

a traverse screw and follower mounted in a traverse box, said traverse box being mounted in an immobile position on said machine, said traverse screw having a first reciprocating drive means and said follower being positioned by said traverse screw to reciprocate along the length of a yarn package,

a traverse yarn guide pivotally mounted on said follower and extending over said yarn package, said yarn guide being adapted to pivot away from said axis in a direction perpendicular thereto,

lifting means for determining the pivotal position of said yarn guide relative to said axis, said lifting means being independent of said bobbin and said spindle, said lifting means comprising a vertically displaceable member adapted to lift said yarn guide, and

control means operatively connected with said lifting means, said control means being adapted to control movement of said yarn guide away from said axis during the winding of said package whereby a small gap is maintained between said traverse yarn guide and the package surface during winding of at least a part of said package, said control means thereby not allowing any part of said mechanism to contact said package surface.

4,884,765

HIGHLY MANOEUVRABLE CONTROL LINE KITE

Keith V. Renecle, 37 Beech Road, Cresslawn, Kempton Park, Transvaal, South Africa

Filed Jun. 17, 1988, Ser. No. 208,049

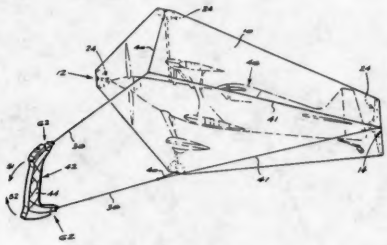
Claims priority, application South Africa, Aug. 3, 1987, 87/5701; Feb. 4, 1988, 88/0788

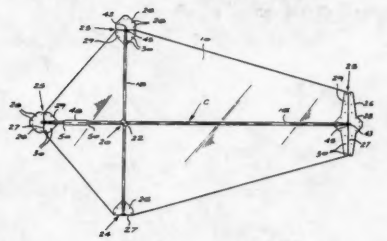
Int. Cl.[4] **B64C** *31/06*

U.S. Cl. 244—153 R **18 Claims**

10. A control line kite which comprises a generally diamond-shaped covering over a framework of spars including a longitudinal spar extending forwardly from a tail end of the

kite to a nose of the kite and a transverse spar crossing the longitudinal spar at a cross-over point, the covering being acted on by wind pressure when the kite is flown such that a center of wind pressure acting on the covering is shifted depending on the orientation of the kite, control line means connected to the kite for controlling orientation of the kite and control handle means to which the control line means is con-





nected, wherein weighting means are positioned on the framework forwardly of a midpoint located halfway between opposite ends of the longitudinal spar such that a center of gravity of the kite is located closer to the nose of the kite than is the center of wind pressure acting on the kite when the kite is flown, with the result that the kite enjoys a high degree of maneuverability in flight.

4,884,766

AUTOMATIC FIN DEPLOYMENT MECHANISM

Harold F. Steinmetz, Ferguson, and Gerald H. Wisdom, Florissant, both of Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

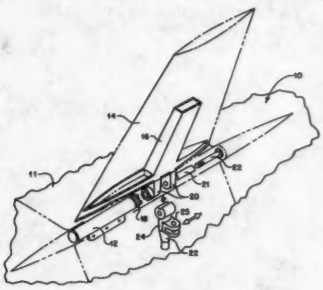
Filed May 25, 1988, Ser. No. 198,279
Int. Cl.[4] F42B *15/027, 15/053*
U.S. Cl. 244—3.27 **20 Claims**

11. A fin fold mechanism for extending a moveable fin from a flight vehicle housing comprising:

a first locking means for locking the moveable fin in a stored position;

actuation means for activating the fin fold mechanism and releasing said first locking means;

a second locking means for locking the moveable fin in an extended position;



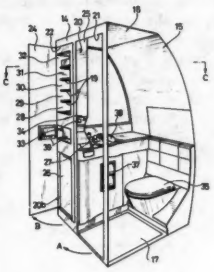
retraction means for disengaging said fin fold mechanism from said moveable fin in order to permit axial rotation of said fin.

4,884,767

LAVATORY MODULE FOR A PASSENGER AIRPLANE

Yoji Shibata, Tokyo, Japan, assignor to Jamco Corporation, Mitaka, Japan

Filed Feb. 27, 1989, Ser. No. 315,767
Claims priority, application Japan, Apr. 4, 1988, 62-44734[U]
Int. Cl.[4] B64D *11/02*
U.S. Cl. 244—118.5 **3 Claims**



1. A lavatory module for a passenger airplane, comprising:

a lavatory box consisting of a substantially rectangular front wall provided on one side thereof with a passage opening and on the other side with a service opening adjacent to the passage opening, a back wall opposite the front wall, side walls interconnecting the front and back walls, a ceiling and a floor, and formed in a shape conforming to a space in the fuselage of the passenger airplane in which the lavatory module is to be installed;

a passage door hinged on the front wall so as to close the passage opening and so as to be opened from outside the lavatory box;

a service door hinged on the front wall so as to close the service opening and so as to be opened from outside the lavatory box;

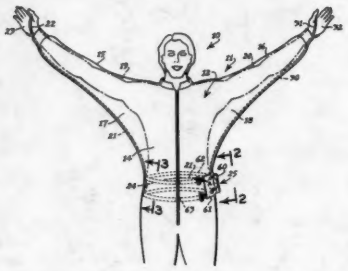
a vertically elongate amenity closet provided within the lavatory box at a position corresponding to the service opening, and having one side opening into the service opening and the opposite side defined by a partition panel.

4,884,768

JUMPSUIT FOR CONTROLLED FREEFALLING

William K. Ansley, 274 Tusculum Rd., Antioch, Tenn. 37013

Filed Oct. 12, 1988, Ser. No. 256,470
Int. Cl.[4] B64D *17/00*
U.S. Cl. 244—143 9 Claims



1. A jumpsuit for controlled freefalling comprising:

(a) a suit body adapted to fit the wearer and having a torso portion and sleeve portions connected to opposite sides of the torso portion, said sleeve portions being adapted to receive the arms of the wearer,

(b) said suit body having an expansible wing portion interconnecting each said sleeve portion with said torso portion,

(c) a wing extender line received within each wing portion, each extender line having outer and inner end portions,

(d) means for holding each said outer end portions fixed relative to its corresponding sleeve portion,

(e) a control member mounted relative to said suit body within the reach of the wearer of said body, and

(f) a control member cooperating with both said inner end portions and having means for pulling said inner end portions to decrease the effective length of said extender lines within said corresponding wing portions, and to expand said corresponding wing portions relative to said suit body when said sleeve portions are extended laterally away from said suit body, to increase the air drag on said jumpsuit.

4,884,769

AERIAL RECOVERY PARACHUTE SYSTEM

Edwin de S. Snead, Georgetown, Tex., assignor to Davis Aerospace Corp., Canyon Lake, Tex.

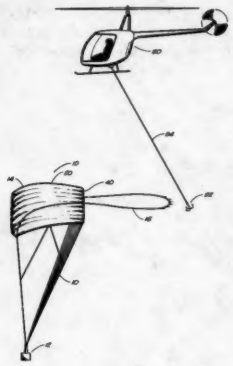
Filed Feb. 1, 1988, Ser. No. 151,305
Int. Cl.[4] B64D *17/02, 17/24*
U.S. Cl. 244—145 8 Claims

5. A mid-air aerial recovery parachute system comprising:

a payload;

a ram-air parachute connected by suspension lines to said payload, said ram-air parachute having a sufficient size to support said payload; and

aerial engagement means connected to said ram-air parachute extending outwardly beyond the top of said ram-air parachute, said aerial engagement means suitable for reception by an aircraft, said aerial engagement means comprising a loop rope fastened to the forward edge of said ram-air parachute, said loop rope having a strength sufficient to support the weight of said payload, said loop rope fastened to opposite ends of the forward edge of said ram-air parachute, said loop rope extending rearward of



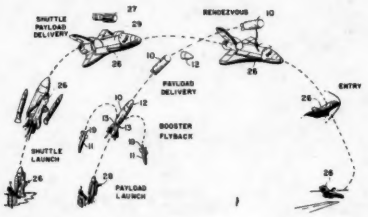
said forward edge a distance at least the length of the wingspan of said ram-air parachute.

4,884,770

EARTH-TO-ORBIT VEHICLE PROVIDING A REUSABLE ORBITAL STAGE

James A. Martin, Gloucester, Va., assignor to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 23, 1987, Ser. No. 76,955
Int. Cl.[4] B64G *1/14*
U.S. Cl. 244—158 R 4 Claims



1. A reusable earth-to-orbit vehicle for use in conjunction with a payload bay equipped, earth-return-capable space vehicle comprising:

an orbital stage sized to fit in the payload bay of said earth-return-capable space vehicle; and

engine means including rocket means internal of said orbital stage for propelling the said orbital stage from the earth's surface to an earth orbit whereby the said orbital stage including said internal rocket means may be received in the payload bay of said earth-return-capable space vehicle and returned to earth for reuse therein.

4,884,771

METHOD FOR CALIBRATING THE GYROS OF A 3-AXIS STABILIZED SATELLITE

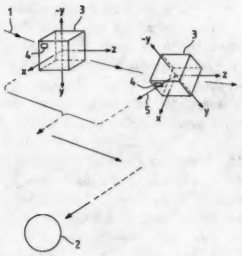
Arnold Scheit, Munich, and Ernst Brüderle, Ottobrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Ottobrunn, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 258,024

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 3734941

Int. Cl.[4] B64G *1/28*

U.S. Cl. 244—165 4 Claims



1. A method for calibrating gyros having an unknown drift and forming part of the attitude control system of a 3-axis stabilized satellite comprising the steps:

(a) providing a two-axis sensor capable of measuring the direction of a radiating reference object in a coordinate system fixed with respect to the satellite,

(b) commanding the satellite to adopt two different reference attitudes during two consecutive time intervals,

(c) obtaining the actual direction of the radiating reference object during the two time intervals,

(d) determining during the two time intervals the deviation of the actual attitude of the satellite from its commanded attitude,

(e) obtaining the time integrals of the gyro's output signals during the two time intervals, and

(f) determining the gyro drift from the time integrals obtained in step (e) and the deviation values obtained in step (d).

4,884,772

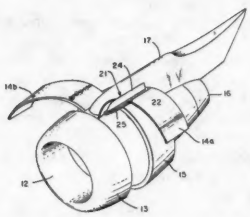
CANTILEVERED VORTEX CONTROL DEVICE

Kurt R. Kraft, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 28, 1986, Ser. No. 889,663

Int. Cl.[4] B64C *23/06*

U.S. Cl. 244—199 9 Claims



1. A vortex control device for cantilevered mounting to the exterior surface of an aircraft nacelle in a position cantilevered forward into the air flow and bridging movable and stationary cowling structure, comprising:

an elongated base portion which is conformal to said nacelle exterior surface, said base portion defining a fastener zone at the aft end forming a plurality of holes for use in attaching said vortex control device to cowling structure and a cantilever zone at the forward end for cantilevered extension over adjacent cowling structure;

a fin coextensive and integral with said base portion and oriented substantially perpendicular to said base portion; and

a resilient seal attached to said base portion in said cantilever zone for sealing between said vortex control device and said adjacent cowling structure.

4,884,773

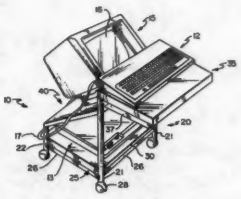
COMPUTER TERMINAL STAND

Joachim H. Becker, Aberdeen, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Filed Jan. 26, 1989, Ser. No. 301,727

Int. Cl.[4] A47B *37/00*

U.S. Cl. 248—639 7 Claims



1. A computer terminal support stand that includes:

an open frame having a pair of vertically disposed front legs and a pair of vertically disposed rear legs, said pair of front legs being longer than said pair of rear legs,

a keyboard table horizontally disposed from the top of said front legs so that the table extends forwardly from said frame,

an inclined platform mounted at one end in the top part of said rear legs and extending upwardly at an angle with the other end of said platform being supported by said front legs,

said platform having adjustable means for mounting a computer monitor thereon so that the viewing screen of the monitor can be selectively positioned in reference to the keyboard table, said adjustable means further including a clamping means that is slidably contained within the platform for securing a monitor to said platform,

a horizontally disposed rectangular shaped bracket mounted between the two pair of legs beneath the inclined platform, and

a shelf mounted upon said bracket for supporting a disc drive.

4,884,774

CABLE LEAD-THROUGH DEVICE

Anton Rodi, Leimen, and Peter T. Blaser, Dielheim, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,550

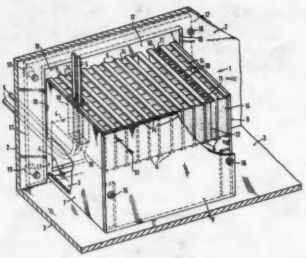
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721484; May 18, 1988, 3816870

Int. Cl.[4] F16L *5/00*

U.S. Cl. 248—56 5 Claims

1. Device for leading cables through an opening formed in a housing wall into the interior of a housing, comprising a rear wall plate releasably fastened to the housing wall and overlapping the opening formed therein; at least two mutually parallel web plates defining a space therebetween and extending per-

pendicularly to said rear wall plate, said web plates having respective foot ends firmly connected to said rear wall plate, and having respective head ends projecting into the interior of the housing; a multiplicity of filler members of mutually equal size formed of elastic material and having a parallelepipedal shape, said parallelpipedal filler members being disposed with respective side surfaces thereof adjacent one another and formed in rows extending consecutively head end to foot end thereof and filling said space between said web plates; at least a plurality of said filler members being formed with a longitudinal bore extending parallel to said rear wall plate for holding a cable therein, and with a longitudinal slot extending from one of the sides of said filler members to the respective longitudinal



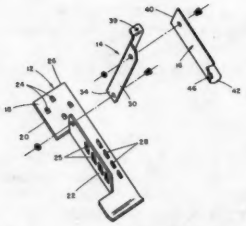
bore formed therein for facilitating the introduction of cables into the respective longitudinal bores; hold-back means provided at said web plates for fixing said filler members against movement in longitudinal direction of said longitudinal bores; an end wall closure plate connected by releasable fasteners to a respective head end of said web plates for clamping against one another said filler members disposed in said rows in said space between said web plates via a filler member projecting beyond said head end of said web plates; said rear wall plate being formed with an opening partly freeing said opening overlapped by said rear wall plate at the side of said foot ends of said web plates for freely admitting cables led therethrough into the interior of the housing.

4,884,775

ADJUSTABLE ROOF BRACKET

Karl W. Fischer, Jr., 7 Rutledge St., West Roxbury, Mass. 02132

Filed Aug. 25, 1988, Ser. No. 236,171
Int. Cl.[4] E04G *3/12*
U.S. Cl. 248—237 **3 Claims**



1. An adjustable roof bracket comprising: a main base portion, a board support portion and an adjustment portion;

the main base portion including a base with a long side edge, a lock portion attached to the base along the long side edge and first and second ends, the lock portion extends from the base in right angle relation to the base and has a series of spaced through apertures, the base having a series of stops in right angle relation thereto near said second end, the stops being positioned longitudinally aligned and in spaced relation to each other and in spaced parallel relation to the lock portion, the lock portion and the stops extend toward the same plane;

the board support portion including first and second frame portions, the second portion having an edge from which the first portion extends in right angle relation thereto, the first frame portion having a first end which is connected in pivoting relation to the lock portion, the second frame portion having a free end opposite the first end of the first frame portion, the free end having a stop portion extending therefrom in right angle relation thereto;

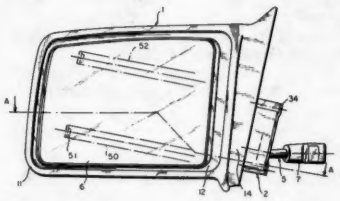
the adjustment portion including a first terminal end, a second terminal end and a long side edge, the first and second terminal ends being in spaced parallel relation to each other and in right angle relation to with the long side edge, a hook portion extends from the adjustment portion in close proximity to the second terminal end, the first terminal end being pivotally connected to the first frame portion whereby the main base portion may be position on a support, the board portion is positioned in a predetermined angular relation to the main base portion, the hook portion engages one of the through apertures in the lock portion and the second terminal end bears against one of the stops of the main base portion, fixing the board support portion in relation to the main base portion and the support.

4,884,776

EXTERIOR MIRROR FOR A VEHICLE

Edwin Seitz, Neuenbuch, Fed. Rep. of Germany, assignor to Hohe KG, Collenberg, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,601
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734254
Int. Cl.[4] A47G *1/24*
U.S. Cl. 248—481 **14 Claims**



1. An exterior mirror for a vehicle, said exterior mirror comprising:

a mirror housing,

a mirror fixed in said mirror housing,

a mirror mounting holding said mirror housing in a normal use position, said mirror housing being swingable forwards and backwards relative to said mirror mounting,

a retention member fixed on said mirror mounting and extending into said mirror housing, said retention member including at least one flexible band anchored at one end at said mirror mounting for allowing swinging of said mirror housing and for simultaneously holding said mirror housing in a horizontal plane with respect to said mirror mounting,

means on said mirror housing for releasably coupling said mirror housing to said mirror mounting in said normal use position and for guiding said at least one flexible band when said mirror housing is released from its normal use position, said means including a slot for accommodating said at least one flexible band, said at least one flexible band extending through said slot to support said mirror

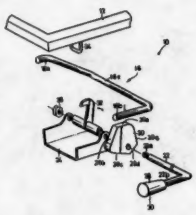
housing and to define a path of travel of said mirror housing exclusively in said horizontal plane when said mirror housing swings forwards and backwards from its normal use position.

4,884,777

SEAT SUSPENSION DEVICE

Takao Sakamoto, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 227,423
Int. Cl.[4] B60N 1/02
U.S. Cl. 248—588 6 Claims



1. A seat suspension device including a seat frame on which a seat is mounted and a lower base frame fixed on a floor, said seat suspension device comprising:

an electric biasing means interposed between said seat frame and said lower base frame, said elastic biasing means being adapted to elastically bias said seat frame away from said lower base frame;

a locking mechanism interposed between said seat frame and said lower base frame; and

a biasing force adjustment means for adjusting a biasing force of said elastic biasing means against said seat frame,

wherein said locking mechanism is so arranged as to lock said seat frame with respect to said lower base frame when the biasing force of said elastic biasing means is reduced at a lowest degree by means of said biasing force adjustment means, and

wherein said locking mechanism comprises a hook member and a hook engagement member, wherein said biasing force adjustment means comprises an operation lever rotatably supported between said seat frame and lower base frame, and a cam having a plurality of discrete cam surfaces, said cam being fixed on the operation lever, and wherein said hook member is fixed on said operation lever, and said elastic biasing means is abutted against said cam, whereby rotation of said operation lever causes simultaneous rotation of said cam and hook member, with such an arrangement that, when said cam presents a cam surface of such a level as to reduce the biasing force of said elastic biasing means at a lowest degree, during the rotation of said cam, said hook member is brought to engagement with said hook engagement engagement member.

4,884,778

ATTACHMENT STRUCTURE OF A STEERING COLUMN

Yoshimi Yamamoto, Shizuoka, Japan, assignor to Fujikiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1988, Ser. No. 188,248
Claims priority, application Japan, Apr. 30, 1987, 62-106926
Int. Cl.[4] B62D 1/16
U.S. Cl. 248—548 8 Claims

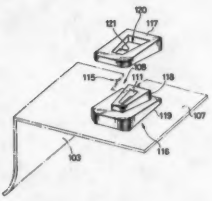
1. An attachment structure of a steering column comprising:

metallic bracket means for attaching a steering shaft to a chassis;

resin slider having a hole and contacting said metallic bracket means with a low frictional coefficient;

metallic slider fitted into the hole of the resin slider and supporting said metallic bracket means in cooperation with said resin slider;

said metallic bracket means being detachable from a space between said metallic and resin sliders by the low frictional coefficient between said resin slider and said metallic bracket means when an excessive impact force is applied to the steering shaft in the axial direction thereof; and



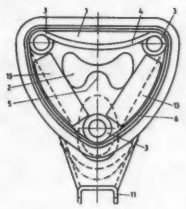
fastening means inserted into the hole of said resin slider, contacting said metallic slider, and fixing said metallic bracket means to the chassis through metallic contact faces of said metallic slider and the chassis such that a fastening force is applied only to said metallic slider.

4,884,779

MOUNT FOR ENGINE, GEARBOX OR SIMILAR PARTS OF A MOTOR VEHICLE

Walter Dräbing, Niestetal, and Kurt Fiedler, Zierenberg, both of Fed. Rep. of Germany, assignors to WEGU Gummi- und Kunststoffwerke Walter Dräbing K.G., Fed. Rep. of Germany

Filed Nov. 7, 1988, Ser. No. 268,173
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 3737988
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—610 7 Claims



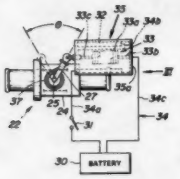
1. A mount for supporting an engine, gearbox or similar parts of a motor vehicle, said mount comprising a first load bearing means comprising a bearing body of elastomer material being elastically deformable in a plane of said bearing body and being constructed to support a load up to a predetermined amount placed upon said mount, and a second load bearing means comprising an extensible, resiliently compliant liner being elastically deformable in said plane and being mounted within said bearing body in a configuration that permits said bearing body to change shape in response to an increasing load applied to said bearing body substantially without said liner bearing any of the load until said liner assumes a stretched configuration, whereupon a further load applied to said mount causes said liner to elongate and bear part of the load applied to said mount.

4,884,780

VALVE ACTUATING ARRANGEMENT

Toshio Ohashi, Atsugi, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 26, 1985, Ser. No. 727,800
Int. Cl.[4] F16K *31/00, 31/18*
U.S. Cl. 251—11 9 Claims



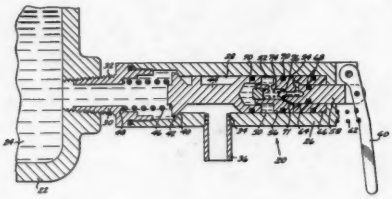
1. An arrangement for controlling fluid flow comprising:
(a) mechanically operated device having means for controlling fluid flow passing through the device;
(b) a device actuating member including means made from a shape memory material for actuating the device to open and close repeatedly according to deformations of the shape memory material due to its temperature rise and drop above and below a critical point;
(c) an electric current supply; and
(d) a thermistor having a positive temperature coefficient, interposed between the electric current supply and the actuating means, and thermally coupled to the actuating means in such a manner to repeatedly open and close the controlling means when current flows through the thermistor.

4,884,781

TAMPER RESISTANT VALVE ASSEMBLY PRIMARILY ADAPTED FOR SAMPLING OF FLUIDS

Burton Barnett, 12592 Martha Ann Dr., Rossmoor, Calif. 90720

Filed Mar. 14, 1989, Ser. No. 323,295
Int. Cl.[4] F16K *21/08*
U.S. Cl. 251—23 28 Claims



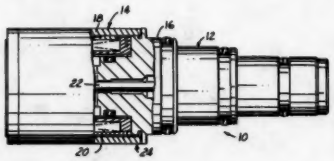
23. A valve assembly adapted for opening fluid flow for a predetermined time, the valve assembly comprising:
first valve means for controlling flow of fluid in a flow path, the first valve means being biased to normally occupy a position where the flow path of the fluid is closed;
hydraulically activated piston means operatively connected with the first valve means for opening the first valve means when an external force is applied to the piston means, the piston means including hydraulic liquid in a first chamber and a first piston, the hydraulic liquid in the first chamber being in operative contact with the first piston which is connected with the first valve means;
means for gradually removing the hydraulic liquid from the first chamber while the hydraulic liquid is under pressure whereby the piston means closes the first valve means, and
relief valve means for returning hydraulic liquid to the first chamber when there is no external force applied to the piston means.

4,884,782

MEANS FOR SEPARABLY ATTACHING SOLENOID TO VALVE

Thomas E. Hensley, Barhamsville, and Gary L. Slack, Newport News, both of Va., assignors to Siemens-Bendix Automotive Electronics L.P., Troy, Mich.

Filed Apr. 14, 1989, Ser. No. 339,022
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.15 4 Claims



1. In a solenoid valve assembly which comprises a magnetically conductive valve body and a solenoid assembly that are axially fitted together and wherein the solenoid assembly comprises a magnetically conductive cylindrical housing having an axial slot along its entire length to allow the housing to be resiliently circumferentially expanded, and the valve body comprises a cylindrical axial surface over which an axial end portion of the housing is fitted, the magnetic flux issued by said solenoid passing between said axial end portion of said housing and said cylindrical axial surface of said valve body, the improvement for retaining said housing to said valve body while still providing adequate area for the flux passing between the two which comprises, said axial end portion of said housing being sized to circumferentially grip said cylindrical axial surface, said valve body having a cylindrical groove immediately behind said cylindrical axial surface, and a plurality of discrete radially inwardly directed stakes formed at the end edge of said axial end portion, said stakes fitting into said groove so as to be in interference relationship with a shoulder that exists between said cylindrical axial surface and said groove.

4,884,783

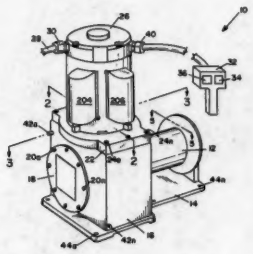
HOIST WITH OIL COOLED BRAKE

R. Bruce McIntosh, Rolling Stone, and Royal G. Thern, Winona, both of Minn., assignors to Thorn, Inc., Winona, Minn.

Filed Feb. 12, 1988, Ser. No. 155,285
Int. Cl.[4] B66D *1/14, 5/10*
U.S. Cl. 254—343 1 Claim

1. A hoist for the hoisting or lowering of a payload, comprising:
a. a lightweight one-piece frame including a sealed speed reducer housing and bearing support member;
b. a reversible vertically oriented motor operated by electrical power for driving a helical pinion, a helical gear, a worm shaft, worm drive, a worm gear and a drum shaft and drum;
c. a one-way clutch and brake drum secured over and about said worm shaft, said clutch free-wheels within said drum during hoisting operations, said clutch engages during a hoisting operation when electrical power is interrupted, said clutch assists in holding hoisted payload until acted upon by reversing of said reversible motor, said worm drive and worm gear is used to hold a hoisted load, and said motor reverse drives said worm shaft and said engaged one-way clutch and said brake drum against the friction of a brake band with a brake lining to reverse said worm gear and said drum to lower a load;

d. a brake band and brake lining positioned over and about said brake drum and one-way clutch;
e. said worm drive engaged with said worm gear to assist in holding a static hoisted payload;
f. a wire rope with a swaged fitting frictionally engaged in a wire rope keyhole to fasten said wire rope to said drum;
g. a drum with a ramp to assist said wire rope winding about said drum;



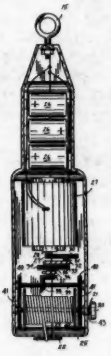
h. a fluid-tight housing containing said brake drum, said brake band, and said brake lining wherein said housing is filled with oil whereby said brake drum, said brake band, and said brake lining are cooled; and,
i. electrical means connected to said motor means and including a first switch to deliver to a second directional switch to control hoisting or lowering of payload and said first switch is a dead-man safety switch.

4,884,784

PORTABLE WINCH

Herman J. Nix, Rt. 1, Box 285, Ider, Ala. 35981, and Roger D. Nix, Rt. 1, Box 263, Sylvania, Ala. 35988

Filed Apr. 25, 1988, Ser. No. 185,800
Int. Cl.[4] B66D *1/12, 1/16*
U.S. Cl. 254—362 **3 Claims**



1. A portable winch apparatus comprising,
an elongate housing means, and
a direct current electrical motor, and
a rechargeable battery means electrically associated with said direct current electrical motor, and
a transmission means operatively coupled between said motor and said windup drum, said windup drum including a flexible line means wrapped around said windup drum terminating in a loop wherein said loop is positioned exteriorly of said housing means, and
said battery means, said electrical motor, said transmission means, and said windup drum are positioned and secured within said housing and aligned within said housing with respect to one another to balance said housing means for portability, and
wherein said apparatus further includes a disengagement means for manually disengaging operative association of said windup drum with said transmission means, and
wherein said disengagement means includes a shaft fixedly secured to said drum and extending exteriorly of said housing, and
drum gears positioned to said shaft coaxially and exteriorly of said drum and further including biasing means for maintaining said drum and said drum gears in operative coupled relationship to said transmission means including a plunger head integrally secured to said shaft and slidably mounted through said housing means to enable displacement of said shaft and displace said drum and said drum gears to a second position in an uncoupled relationship to said transmission, and
wherein said shaft is rotatably secured between opposed walls of said housing within a first boss and a second boss wherein said first boss includes a retraction space for accepting a terminal end of said shaft when displaced to said second position, and
wherein said first boss and said second boss further include bearings for rotatably securing said shaft coaxially of said bearings in a slip-fit relationship to said bearings, and
wherein said transmission means includes a first output gear and an enlarged second gear, said first output gear rotatably and fixedly secured to an output shaft of said motor with said first output gear operatively associated with said enlarged second gear, said second gear axially displaced from said first output gear, and a third gear coaxially aligned with and spaced from said second gear and of a lesser diameter than said second gear, and a fourth gear operatively coupled to said third gear, axially displaced from said third gear and having an axis parallel to an axis of said first output gear, and a plurality of output gears coupled to said fourth gear, said output gears being selectively coupled to said drum gears, and
wherein an alternating to direct current plug is positioned within said housing within a recess of said housing directed outwardly for access to a recharging plug to recharge said battery means, and
wherein said battery means includes a plurality of batteries symmetrically positioned within said housing about a housing axial line coaxial with said motor.

4,884,785

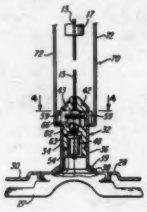
APPARATUS FOR SECURING A SPARE TIRE ON A VEHICLE

Stephen A. Denman, Centerville, and Garthwood R. Taylor, Dayton, both of Ohio, assignors to Deuer Manufacturing Inc., Dayton, Ohio

Filed Aug. 26, 1988, Ser. No. 237,189
Int. Cl.[4] B66D *1/00*
U.S. Cl. 254—389 **17 Claims**

1. Apparatus for securing a spare tire and wheel assembly in an elevated stored position and adapted to be used under a vehicle body, said apparatus comprising a tire lift/carrier unit including a depending flexible cable, first support means connecting said cable to said assembly, said cable being extendable and retractable in response to actuation of said tire lift/carrier unit for moving said first support means and said assembly between said elevated stored position and a lower ground engaging position, second support means independent of said cable for supporting said first support means and said assembly in an elevated position spaced above the ground, one of said support means including a connecting member movable between a released position and an engaged position connecting

said first support means to said second support means, and means for moving said connecting member to said engaged



position in response to failure of said cable to support said assembly in said stored position.

4,884,786

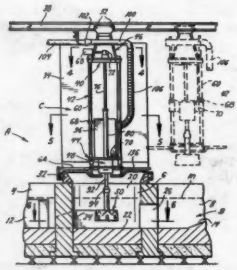
APPARATUS FOR GENERATING A VORTEX IN A MELT

John R. Gillespie, Ballwin, Mo., assignor to Gillespie & Powers, Inc., Ballwin, Mo.

Filed Aug. 23, 1988, Ser. No. 235,163

Int. Cl.[4] C21C *7/00*

U.S. Cl. 266—235 **26 Claims**



1. In combination with a furnace for maintaining metal that is within it in a molten condition as a melt, and further having a charging well which opens upwardly and contains a portion of the melt, so that the melt is exposed in the charging well, the improvement comprising: a track located generally above the charging well as well as beyond the charging well and a vortex generator suspended from the track, the vortex generator including a trolley which rolls along the track, an elevator suspended from the trolley, an impeller suspended from the elevator and being exposed generally below the elevator, drive means for rotating the impeller, and elevating means for varying the distance between the trolley and the elevator to lower the impeller into the melt within the well, so that it creates a vortex within the portion of the melt that is in the well, and to further raise the impeller out of the well to an elevation high enough to permit the vortex generator to be displaced on the track to a position remote from the well.

4,884,787

REFRACTORY, CERAMIC, SHAPED MEMBER

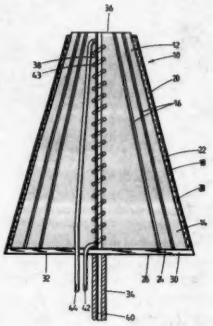
Dötsch Lorenz, Vallendar; Karl-Heinz Höfer, Urmitz; Jean-Louis Retrayt, Neuwied, and Bernd Kull, Bad Breisig, all of Fed. Rep. of Germany, assignors to Radex Deutschland Aktiengesellschaft für feuerfeste Erzeugnisse, Urmitz, Fed. Rep. of Germany

Filed May 24, 1988, Ser. No. 197,849

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717840

Int. Cl.[4] C21C *5/48*

U.S. Cl. 266—270 **12 Claims**



1. A refractory, ceramic, shaped member for supplying gas and/or solid material to molten metal in a metallurgical vessel; the shaped member having a first end facing said molten metal, and a second end remote from said first end; said shaped member being provided with a passage extending from said second end, where it can be connected to a supply pipe for said gas and/or solid material, to said first end, where said passage opens out, with said passage being large enough to permit solid material to be conveyed therethrough; and means associated with said passage being provided to prevent molten metal from penetrating through said passage,

said means being closed toward the molten metal and including a cooling device which comprises a cooling pipe that is disposed directly adjacent to said passage, and through which a cooling fluid can flow via a feed pipe, the cooling pipe and a discharge pipe forming a closed-loop system for cooling at least that portion of said passage disposed in the vicinity of said first end of said shaped member.

4,884,788

BORON NITRIDE CONTAINING VESSEL HAVING A SURFACE COATING OF TITANIUM IRON-SILICON THEREON

Gregory W. Shaffer, Brunswick, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 12, 1988, Ser. No. 180,578

Int. Cl.[4] C21B *3/00*

U.S. Cl. 266—275 **8 Claims**

1. An evaporation vessel comprising boron nitride, said

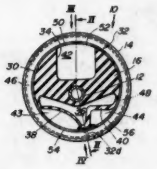
vessel having at least a portion of its surface coated with a titanium-iron-silicon layer.

4,884,789

POWER UNIT MOUNTING DEVICE

Masaru Takeda, Tokyo, and Toshiyuki Tabata, Sagamihara, both of Japan, assignors to Nissan Motor Co. Ltd., Japan

Filed Dec. 27, 1988, Ser. No. 290,298
Claims priority, application Japan, Dec. 28, 1987, 62-335469
Int. Cl.[4] B60K *5/12*; F16F *13/00*
U.S. Cl. 267—140.1 8 Claims



1. A fluid-filled mounting device comprising:
an inner cylindrical member;
an outer cylindrical case surrounding said inner cylindrical member;
a cylindrical elastomer block disposed between said inner cylindrical member and said outer cylindrical case;
means defining in said elastomer block a main recess;
means defining in said elastomer block a deformable chamber at a portion diametrically opposite to the portion where said main recess is defined, said deformable chamber having an outer wall which includes first and second diaphragms, said first diaphragm having a spring constant different from that of said second diaphragm;
an annular hollow structure disposed about said elastomer block in a manner to cover said main recess and said first and second diaphragms, thereby to define a main fluid chamber by said main recess, a first auxiliary fluid chamber by said first diaphragm and said annular hollow structure and a second auxiliary fluid chamber by said second diaphragm and said annular hollow structure;
a first flow restricting path defined by said annular hollow structure for fluid communication between said main fluid chamber and said first auxiliary fluid chamber; and
a second flow restricting path defined by said annular hollow structure for fluid communication between said main fluid chamber and said second auxiliary fluid chamber.

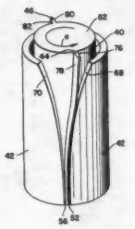
4,884,790

NONLINEAR TORSION SPRING

Paul Castrilli, Apt. F5, 280 Bridgewater Road, Brookhaven, Pa. 19015

Filed Jun. 1, 1988, Ser. No. 200,920
Int. Cl.[4] F16F *1/48*
U.S. Cl. 267—154 7 Claims

1. A nonlinear torsional spring comprising:
a flexible and resilient inner torsion member having a central axis and first and second axial ends;
an outer torsion member fixedly secured to the inner member adjacent the first end thereof and extending along the inner member toward the second end;
a contact means on one of the inner and outer members which contacts a portion of the other of the inner and outer members along an increasing length of the contact means at a position progessively nearer the second axial



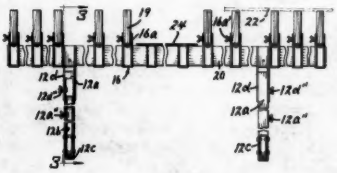
end as an increasing torque is applied to one of the inner and outer members.

4,884,791

WORK SUPPORT STRUCTURE

Daryl T. Callender, 1201 Britain Dr., Lawrenceville, Ga. 30245

Filed Aug. 14, 1985, Ser. No. 765,602
Int. Cl.[4] B25B *1/02*
U.S. Cl. 269—88 3 Claims



1. A work support structure comprising an elongated spine member, legs supporting said elongated spine member, a series of support sections mounted at preselected locations along the longitudinal axis of said elongated spine member, each of said support sections including a saddle through which said elongated spine member extends in a saddle stabilizing relationship, work support members, and a channel mounted on each of said saddles receiving one of said work support members, where said work support members extend outwardly from each side of said elongated spine member, where fastening means selectively position said saddles along said longitudinal axis of said elongated spine member, where the upper surfaces of said work support members combine in a work receiving relationship, and where said fastening means is a pivotal snap clip mounted on said saddles in an underlying relationship with said elongated spine member.

4,884,792

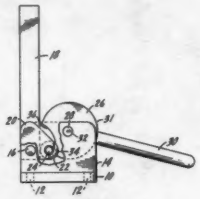
CLAMP

Roy Rendahl, Minnesota City, and Edward L. Steele, Winona, both of Minn., assignors to Lake Center Industries a division of Guy F. Atkinson Company, San Francisco, Calif.

Filed Aug. 11, 1988, Ser. No. 230,901
Int. Cl.[4] B25B *1/14*
U.S. Cl. 269—236 7 Claims

1. In a manually operated clamp, a base, a clamp bar pivotally mounted on the base, a pivotally mounted handle bar and cam unit with a cam and handle bar, a roller follower unit, one of the units being pivotally mounted on the base in spaced relation to the clamp bar pivot, the other unit being mounted to rotate with the clamp bar and positioned eccentric to the pivot of the clamp bar, a cut out in the face of the cam opposite the roller conforming generally to the exterior of the roller and adapted to engage the roller when the handle bar is in its

release position to hold the clamp bar in a raised inoperative position, and a clearance on the face of the cam adjacent the cut out that will clear the roller when disposed opposite it so



that when the roller is released from the cut out, the cam bar can be pivoted to its clamping position and the handle bar may be operated to bring the cam into engagement with the roller to lock the cam bar in place.

4,884,793

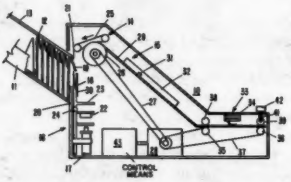
PICKER-STRIPPER-FEEDER FOR ENVELOPE FEEDING APPARATUS

Richard F. Hurst, 126 Steeplechase Rd., Devon, Pa. 19333

Filed Jun. 22, 1987, Ser. No. 65,292

Int. Cl.[4] B65H *3/26*

U.S. Cl. 271—2 **19 Claims**



19. A method of extracting and feeding an envelope having an exposed flap from the open end of a magazine containing a plurality of envelopes without misfeeding or double feeding comprising the steps of:

forcing an elongated picker blade under the flap of an envelope to be removed from said magazine to establish a straight leading edge in the fold flap,

stripping and separating the lead edge of said fold flap of said envelope from the other envelopes by imparting a stripping movement to said picker blade so as to strip and separate the straight leading edge of said envelope from other envelopes and to move the leading edge of said flap of said envelope orthogonally past a restraining means adapted to prevent movement of another envelope in the feed direction,

imparting a linear motion to said picker blade in the feed direction so as to remove said envelope from said magazine and pass said restraining means and to strip the envelope from adjacent envelopes, and

feeding said envelope in a feed direction past said restraining means into transfer means for conveying said envelope to utilization means.

4,884,794

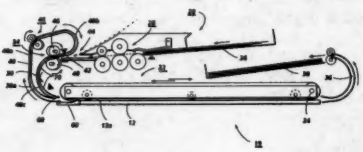
DUPLEX DOCUMENT HANDLER

Ernest L. Dinatale, Rochester, and George J. Roller, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 6, 1988, Ser. No. 202,348

Int. Cl.[4] B65H *5/22*

U.S. Cl. 271—3 **6 Claims**



1. In a dual mode auto-duplex document handler, in which simplex or duplex document sheets are fed from a document tray, generally overlying the platen of a copier, to the platen, and in which simplex documents are so fed downstream from said tray to one side of said platen through a simplex document feeding path, wherein said simplex path has a generally "C" shaped single inversion path section adjacent said one side of said platen, the improvement comprising:

a document side edge registration system system in said simplex path for laterally moving a document in a side registration direction;

duplex document inversion path means for providing a duplex document inversion path integral with and partially in common with said simplex path, which duplex document inversion path is a unidirectional and partially folded compact loop path extending from and back to one side of said platen;

said duplex document inversion path having first and second inverting path segments separate from said simplex path, and a third inverting path segment integral said simplex path single inversion path section, wherein said duplex document inversion path first provides two inversions of duplex documents in said first and second path segments and then connects with and feeds the duplex documents into said simplex path upstream of said single inversion path section so that a total of three inversions is provided for duplex documents by said duplex document inversion path, so that the duplex documents are returned to the platen inverted from their previous orientation on the platen;

wherein said first path segment of said duplex document inversion path is generally "C" shaped and extends generally parallel to, with the same facing direction as, and closely outside of, said simplex document path generally "C" shaped single inversion path section;

and wherein said second inverting path segment connets said first path segment into said simplex path upstream of said side edge registration system therein and upstream of said single inversion path section thereof, and so that the duplex documents are moving in the same direction as the simplex documents in said simplex path, and so as to provide the same document side edge registration lateral movement direction for duplex documents being inverted as for simplex documents;

and diverting means for selectively diverging duplex documents to be inverted into said first path segment of said duplex document inversion path;

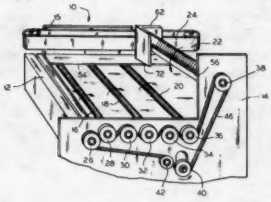
so that duplex documents diverted into said duplex document inversion path by said diverting means are returned to said platen inverted from their previous orientation on said platen after passing through said first and second inverting path segments, said document side edge registration system, and said single inversion in said simplex path single inversion path section.

4,884,795

DOCUMENT FEEDER APPARATUS

Gary Vander Syde, Naperville, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 26, 1988, Ser. No. 199,371
Int. Cl.[4] B65H *3/04*
U.S. Cl. 271—34 **18 Claims**



1. In a document feeder apparatus for receiving a supply of documents and delivering the documents to a feed station at which the documents are separated individually from the document supply, and improved conveyor comprising:

a plurality of first auger means mounted on a magazine section of the conveyor and adapted for rotation about substantially parallel axes located in a common horizontal plane;

a continuous spiral groove on each of said first auger means having two different sized pitches, the larger pitch being located nearer the feed station, said grooves adapted to receive the lower edges of the documents and being arranged to convey the documents along said horizontal plane toward the feed station of the conveyor in response to rotation of said first auger means;

at least one raised second auger means mounted on the magazine section of the conveyor and adapted for rotation about and axis oriented generally paralled to the rotational axis of said first auger means, said raised second auger means being elevated relative to said common horizontal plane at a location to engage a vertical edge of each document located on said first auger means;

a continuous spiral groove on said second auger means with two different sized pitches, the larger pitch being located nearer the feed station, said groove on said second auger means adapted to receive said vertical edge of the documents to assist in conveying the documents and maintaining the vertical orientation thereof in response to rotation of said second auger means;

drive means for effecting rotation of said first and second auger means to convey the documents along the magazine section to the feed station of the conveyor;

means disposed at said feed station for transporting the documents one at a time from said supply of documents; and

a plurality of joggers included within the continuous spiral groove of the first auger means which is located closes to the second augers means, said joggers affixed at the base of said groove.

4,884,796

SINGULATOR FOR DOCUMENT FEEDER

Henry A. Daboub, 1420 Grand Teton, DeSoto, Tex. 75115

Filed May 26, 1988, Ser. No. 198,871
Int. Cl.[4] B65H *3/06*
U.S. Cl. 271—111 **11 Claims**

1. A singulator for feeding single documents from a stack of documents, said singulator comprising:

a movable feeder gate;

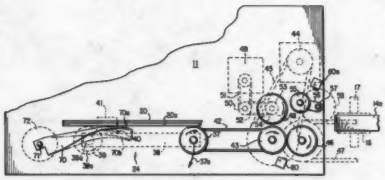
means for moving said feeder gate between closed and released position, said feeder gate normally being in a closed position;

a pick-off means for picking off documents one at a time from said stack of documents, said pick-off means comprises:

roller means for engaging the first document of said stack of documents;

means for driving said roller means in a forward direction upon demand to remove said first document in contact therewith, and

means for engaging any additional documents removed with



said first document to prevent movement of said any additional documents with said first document;

means for feeding said stack of documents into contact with said pick-off means and said gate when said gate is in said closed position; and

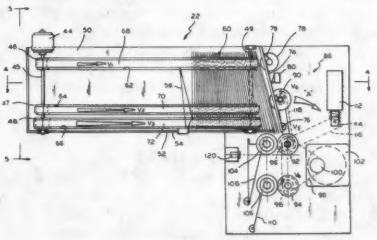
means for simultaneously moving said gate to said released position and for actuating said pick-off means whereby the compression of said stack of documents is relaxed as pick-off means removes the first document from said stack.

4,884,797

FEEDER MODULE FOR USE IN A DOCUMENT FORWARDING SYSTEM

Eduard Svyatsky, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 16, 1987, Ser. No. 109,714
Int. Cl.[4] B65H *1/02*
U.S. Cl. 271—126 **25 Claims**



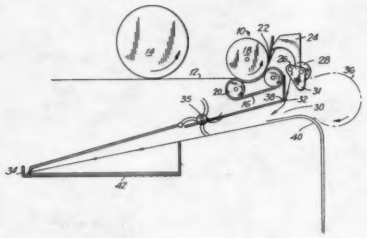
1. A horizontal feeder means for feeding documents including means for fanning said documents to assist in the sequential delivery of a single document to a lateral position, said feeder means includes a generally horizontally disposed receptacle having an elongated substantially planar base and at least one side restraining means adapted to accept a plurality of documents each having the lower one edge engaging said base in generally transverse vertically oriented document disposition, means providing a bias of force against the stack of said plurality of documents, said fanning means including at least two means exerting at least two spaced points of force against said lower one edge of each said document, said fanning means including a plurality of movable means exposed in said planar base and adapted to contact said lower document edge at spaced points and said movable means having differing velocities of motion in the same direction.

4,884,798

COPY TURN AROUND MECHANISM FOR REPRODUCTION MACHINE

David Vermaat, Port Crane, N.Y., assignor to Imagitek, Binghamton, N.Y.

Filed Mar. 11, 1988, Ser. No. 166,930
Int. Cl.[4] B65H *29/54*
U.S. Cl. 271—307 **7 Claims**



1. A media feed mechanism for a reproduction machine comprising:

means for removing the media from a drum rotating in a direction which urges the media long a first path into the machine from a first side thereof;

guide means receiving the media from said removing means and directing the media to a drive means for driving the media;

wherein said drive means comprises an idler wheel and a drive wheel, said idler wheel being mounted on an idler wheel swing assembly which pivots about a rotation axis passing through said drive wheel, said swing assembly pivoting between a first position directing the leading edge of said media along a second path and a second position directing portions of said media to a third path;

wherein said drive means directs a leading edge of said media directly into a receiving means along said second path and directs a subsequent portion of said media along said third path so that said media forms a loop as the media travels to said receiving means whereby said media may be retrieved from said machine first side;

wherein said receiving means is disposed within said machine substantially parallel to and opposite from said first path and directed to said machine first side.

4,884,799

WALKER

Mong-Hsiang Chai, No. 41, Section 1, Ching Sha St., Tainan, Taiwan

Filed Sep. 28, 1988, Ser. No. 250,072
Int. Cl.[4] A61H *3/00*; B62B *1/00*; A47D *13/04*
U.S. Cl. 272—70.3 **2 Claims**

1. A height adjustment mechanism for use in a baby walker, comprising:

a base member having: (1) a square shaped recess formed adjacent one end thereof, (2) a longitudinally extended recess joining said square shaped recess on a first end, (3) a transverse recess intersecting said longitudinally extended recess, and (4) a bore extending from a second end of said longitudinally extended recess;

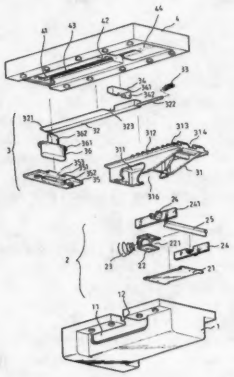
a cover member adapted for coupling with said base member and having a pair of through openings formed on opposing sides thereof, said cover further having a pair of inner recesses wherein each of said inner recesses is formed in an inner surface of a base portion of a respective one of said opposing sides;

means for height adjustment including:

(a) a sliding rod having an inclined surface on one end and a post extending from an opposing end, said sliding rod having a portion operatively positioned within said longitudinally extended recess with said post extending into said bore formed in said base member,

(b) a first bracket member having a plurality of beveled tooth-like projections extending from a base surface in two substantially parallel rows, said rows of tooth-like projections defining a first channel therebetween for receiving a portion of said sliding rod,

(c) a block member positionally located within said transverse recess of said base member and being spring biased against a camming surface of said sliding rod, said block member having a pair of detents between which defines a second channel for receiving a portion of said sliding rod, each of said detents being releasably lockingly engaged with a respective one of said plurality of tooth-like projections,



(d) a guide block member operatively received within said base member square shaped recess, said guide block having an inclined surface matingly interfaced with said inclined end surface of said sliding rod for displacing said sliding rod responsive to displacement of said guide block member, whereby responsive to said sliding rod displacement said block member is sufficiently displaced by said camming surface of said sliding rod to disengage said detents from said toothlike projections and thereby permit said first bracket member to be displaced relative to said base member; and,

means for shock absorbing disposed within a cavity formed in said bracket member, said shock absorbing means includes a pair of shield members slidingly coupled to said height adjustment means and each having a through opening for passage of a rod member therethrough, each of said shield members providing a closure for a respective one of said cover member through openings.

4,884,800

ROWING MACHINE

John H. Duke, 19 Cold Spring St., Providence, R.I. 92906

Continuation of Ser. No. 49,616, May 13, 1987, Pat. No. 4,846,460. This application May 8, 1989, Ser. No. 348,782
Claims priority, application PCT Int'l Appl., Nov. 17, 1988, WO88/08735
Int. Cl.[4] A63B *69/06*
U.S. Cl. 272—72 **3 Claims**

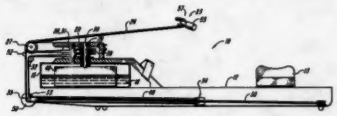
1. In an exercise device having frame means, a drive cord capable of reciprocal motion during cycles of operation including a pulling segment in which the drive cord is unwound from a recoil mechanism in a first direction and a recovery segment in which the drive cord moves in the direction opposite said first direction and is rewound on said recoil mechanism said

recoil mechanism being mounted on the frame means, the improvement comprising:

a hollow container mounted on said frame;

a supply of liquid held in said container,

liquid rotating means rotatably mounted within said container at its center and spaced from the walls of said container to rotate said supply of liquid within said container in response to movement of said drive cord during said pulling segment, said container having an inner surface in contact with said liquid, said inner surface being shaped to allow free movement of the liquid thereby allowing said supply of liquid to continue to rotate within said container during said recovery segment to produce thereby a liquid flywheel moving within said container and thereby maintaining the rotation of the liquid rotating means during the recovery segment and



translating means mounted on said frame means and operatively connected to said liquid rotating means for translating a reciprocating motion of said drive cord during each cycle of operation into a one-way rotation of said liquid rotating means in response to said pulling segment of said cycle of operation, said translating means being coupled to said drive cord and said recoil mechanism,

said supply of liquid when rotating producing resistance to said pulling segments due principally to turbulence at the liquid-container interface, and

said liquid rotating means being capable of rotating in unison with said rotating liquid during said pulling and recovery strokes.

4,884,801

LOAD APPLYING DRIVING APPARATUS FOR AN EXERCISE DEVICE

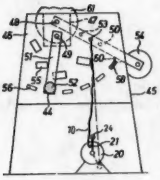
Josef Schnell, Sportweg 9, Ortsteil Peutenhausen, 8899 Gachenbach, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 264,197

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 3737980

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—117 **24 Claims**



1. An exercise device; comprising:

a user-actuated member;

weight means connectable to said user-actuated member for providing resistance during exercise; and

driving means acting on said user-actuated member independently of said weight means for exerting a load on said user-actuated member, said driving means including a motor, a crank mechanism operatively connected to said motor and a flexible transmission member connecting said crank mechanism with said user-actuated member for allowing application of the load as exerted by said motor to said user-actuated member, said flexible transmission member being alternately in a loose and tight state during operation of said motor so that said user-actuated member is selectably acted upon by the load of said driving means during a lifting stroke and during a return stroke.

4,884,802

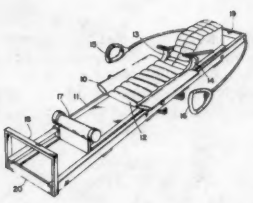
EXERCISE APPARATUS ADJUSTABLE DURING USE

Gary A. Graham, P.O. Box 2000, Glacier, Wash. 98244

Filed Nov. 8, 1988, Ser. No. 268,877

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—136 **3 Claims**



1. An exercise apparatus comprising a track assembly having a first end and a second end, a carriage for supporting a user in the supine position, means for supporting said carriage in said track whereby said carriage is free to move between said first and second ends, hand grippable means attached to said track assembly whereby said user, by applying hand forces, can set said carriage into reciprocating motion on said track assembly and adjustable energy storage and release means for biasing said carriage toward a position on said track assembly, said apparatus further comprising:

means for enabling adjustment of said energy storage and release means while said apparatus is in use,

said adjustable energy storage and release means further comprising:

at least one bungee apparatus attached to said carriage,

at least one catch attached to said track assembly and having an engaged condition and a disengaged condition,

means for adjusting said at least one catch into said engaged condition,

said at least one bungee apparatus being set into engagement with said at least one catch when said at least one catch is adjusted to said engaged condition by said means for enabling adjustment,

said carriage and said track assembly having a position for engagement which enables engagement of said at least one catch with said at least one bungee apparatus,

said engagement occurring when said at least one catch is adjusted to said engaged condition and said carriage and said track assembly are in said position for engagement,

said catch means further comprising means for enabling said engagement to occur when said at least one catch is adjusted to said engaged condition and said carriage moves on said track assembly to put said carriage and said track assembly into said position for engagement.

4,884,803

VARIABLE INCLINE EXERCISE APPARATUS

Jeffrey J. Miller, 2450 Westmont Way West, Seattle, Wash. 98199

Filed May 22, 1986, Ser. No. 866,234

Int. Cl.[4] A63B *23/02*

U.S. Cl. 272—145 **11 Claims**

1. An automatic, variably inclinable exercise apparatus, comprising;

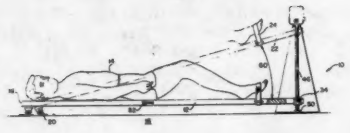
a support surface for a user;

means for pivoting the support surface relative to a horizontal reference;

means, on the support surface, for releasably restraining the

feet of a user during an abdominal muscle toning exercise; and

means for automatically controlling the pivoting means so that the angle defined by the support surface and the



horizontal reference is automatically and cyclically varied to cyclically inclinate and declinate the support surface during an abdominal muscle toning exercise, so that a continuously varying load is felt by a user during a single repetition of the abdominal muscle toning exercise.

4,884,804

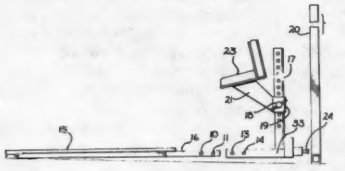
EXERCISE APPARATUS

Chad Fenwick, 8954 Nestle Ave., Northridge, Calif. 91325

Continuation of Ser. No. 881,644, Jul. 2, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 144,633

Int. Cl.[4] A63B *23/02*

U.S. Cl. 272—145 **12 Claims**



1. An exercise apparatus for performing a sit up exercise comprising:

a base having a stationary support for supporting the torso of a user during said exercise;

an elongated member coupled to said base and substantially perpendicular to said base; and

a support member coupled to said elongated member independently of said base and disposed above the plane of said base for elevating a user's lower legs and feet relative to his torso and supporting the user's feet and legs during said exercise, said support member comprising at least one pocket for preventing downward and lateral movement of said feet and allowing upward movement, the user's lower back being forced to curve outwardly during said exercise as a result of the user's lower legs and feet being elevated relative to the torso, thus reducing stress and risk of injury, utilization of said support member with at least one pocket providing the sole restraint for the user's feet.

4,884,805

TURF REPAIR APPARATUS

James V. Patterson, 2958 SE. Delmar St., Port Salerno, Fla. 34992

Continuation-in-part of Ser. No. 84,758, Aug. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 876,733, Aug. 7, 1986, abandoned. This application Oct. 26, 1988, Ser. No. 262,886

Int. Cl.[4] A63B *57/00*; A01B *1/18*

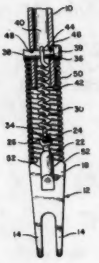
U.S. Cl. 273—32 B **9 Claims**

1. A tool for smoothing turf, comprising:

a tongue having a lower portion with prongs to be inserted into the turf, said tongue further comprising an upper portion having an attachment means;

an elongated handle for holding the tool, said handle having means of attachment at its lower end, and further comprising stop means;

a tension spring extending from said attachment means of said upper portion of said tongue to said attachment means of said handle; and,



a compression spring surrounding said tension spring and abutting against said upper portion of said tongue at one end, and against said stop means of said handle at the other end.

4,884,806

METHOD OF PLAYING A BOWLING GAME

Ted E. Brim, Grand Haven, Mich., assignor to Brunswick Corporation, Skokie, Ill.

Filed Feb. 29, 1988, Ser. No. 162,147

Int. Cl.[4] A63D *3/00*

U.S. Cl. 273—37 **13 Claims**

1. A method of playing a bowling game in which players are allowed at least one ball to deliver during a turn of play, said method comprising:

providing a pin setup for each turn of play;

selecting a given trajectory for a ball to follow down a lane;

requiring a player to deliver at least one ball down the lane in an attempt to duplicate said given trajectory and to attempt to knock down pins while following the given trajectory;

determining the degree to which the player's delivered ball duplicates the given trajectory up to the point that the ball reaches the pin setup; and

awarding a score to the player which is at least partially a function of the degree to which the player's ball duplicated the given trajectory independent of the number of pins knocked down.

4,884,807

PILE-SURFACED BALL AND METHOD OF MAKING THE SAME

James W. Welch, 1437 N. Manzanita, Unit G, Orange, Calif. 92667

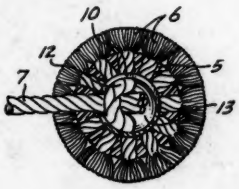
Filed Apr. 8, 1988, Ser. No. 179,099

Int. Cl.[4] A63B *43/02, 37/14, 39/06*

U.S. Cl. 273—58 C **13 Claims**

1. A ball having a dense pile surface comprising a cluster of stubs of stranded frayable material having their inner end

portions bonded together in closely spaced relationship and their outer end portions frayed or fluffed to form the dense pile



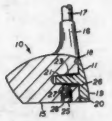
surface composed of tightly packed clusters of frayed or fluffed strands.

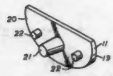
4,884,808

GOLF CLUB WITH HEAD HAVING EXCHANGEABLE FACE PLATES

Jerome E. Retzer, 103 Forest Ridge Dr., Brevard, N.C. 28712

Filed Mar. 24, 1988, Ser. No. 172,389
Int. Cl.[4] A63B *53/08*
U.S. Cl. 273—77 A **4 Claims**





1. A golf club head having exchangeable face plates comprising;

a body having a face portion, a toe portion, a heel portion, a sole portion, and a hosel portion,

a recessed surface formed on said face portion having a plurality of bores extending inwardly a distance into the body,

a plurality of face plates removably securable on said recessed surface and having respective face plate striking surfaces configured to impart predetermined flight characteristics to the ball corresponding to clubs ranging from U.S.G.A. #1 through #14,

each said face plate having a flat rear surface with a plurality of projections extending outwardly therefrom to be received in said bores and a front ball striking surface which is configured to impart predetermined flight characteristics to the ball when struck thereby,

said one or more bores in said recessed surface comprising a central tapered bore and a pair of second bores, one spaced laterally to each side of the first bore extending inwardly from said recessed surface to receive said projections,

said one or more projections on said face plate rear surface comprise a tapered projection extending outwardly from the center of the rear surface of said face plate and a pair of smaller dowels extending outwardly from the rear surface, one spaced laterally to each side of the tapered projection and corresponding axially to the spacing of said bores, and

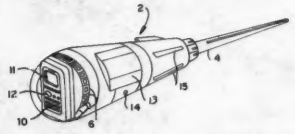
means for securing removably and replaceably said face plate non-rotatably on said body face portion extending from said body sole portion and releaseably engaging said tapered projection to secure said face plate on said recessed surface, and comprising a set screw threadedly received in a threaded bore extending from the sole portion of said body and at a right angle to and operatively engaging said tapered projection of said face plate and a clamping member comprising a small cylindrical plunger slidably received in the threaded bore and moved into engagement with said tapered projection by said set screw, the taper on said projection being effective to move said plunger back into said threaded bore on insertion into said tapered bore.

4,884,809

INTERACTIVE TRANSECTOR DEVICE

Larry Rowan, 3440 Caroline Ave., Culvar City, Calif. 90230

Filed Dec. 30, 1985, Ser. No. 814,743
Int. Cl.[4] F41B *15/04*
U.S. Cl. 273—84 ES **10 Claims**



1. A portable, non-lethal, anti-personnel device including;

case carrying, at one end, device control and display means and, at the other end, a telescoping, multi-layer barrel having at least first, second and third concentric layers;

said first layer being the outermost layer and being electrically conducting and non-porous to volatile materials;

said second layer being of the next lesser diameter and being permeable to volatile materials;

said third layer being of the least diameter of the three layers and being hollow to form a bore for projectiles;

said case carrying there within personnel-disabling means electrically coupled to and controlled and monitored by said device control-and-display means;

said personnel-disabling means including a chemical source of volatile chemical materials, said chemical source being fluidly coupled to said second layer of said telescoping barrel;

said personnel-disabling means including, in addition, a source of high-frequency electrical energy and a source of radio-frequency energy electrically coupled to said first layer of said telescoping barrel;

said personnel-disabling means including, in addition, a source of projectiles said source communicating with said bore in said third layer for the passage of projectiles out of said device from said personnel-disabling means;

central logic means carried by said case and electrically coupled between said control-and-display means and said personnel-disabling means and responsive to adjustment of the controls in said control and display means to select and activate a selected one of said personnel-disabling means; and,

power means electrically coupled to said control-and-display means, to said personnel-disabling means and to said central logic means for powering said device.

4,884,810

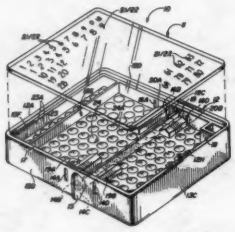
CHANCE DEVICE WITH VARIABLY SIZED NUMBER SELECTING COMPARTMENTS

Joseph Tiyony, P.O. Box 34626, Phoenix, Ariz. 85067

Filed Nov. 28, 1988, Ser. No. 276,885
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—144 B **9 Claims**

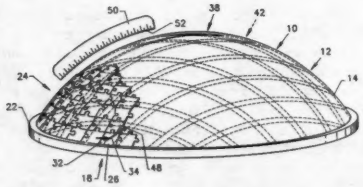
1. A hand held game device for randomly selecting numbers for a plurality of different types of games of chance, said game comprising:

(a) a generally rectangular container containing a substantially horizontal bottom, and an endless sidewall upstanding from said bototm;
(b) a plurailty of indentations formed into said bottom, said indentations being formed into a plurality of spaced apart rows;
(c) a transparent cover extending over and closing said container;
(d) a plurality of indicia carried bys aid cover, each of said



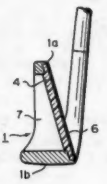
indicia being aligned with a respective one of said plurality of indentations;
(e) at least one ball freely movable within said container and receivable within said each of said plurality of indentations; and
(f) a partition for dividing said container into a first compartment containing at least one of said rows, and a second compartment containing the other of said rows, said partition being movably positionable whereby the number of rows in each of said compartments is selectively variable.

4,884,811
PUZZLE APPARATUS
Dora Devorak, 1749 Lexington St., El Cerrito, Calif. 94530
Filed Nov. 2, 1988, Ser. No. 265,937
Int. Cl.[4] A63F *9/12*; G09B *27/08*
U.S. Cl. 273—157 A **3 Claims**



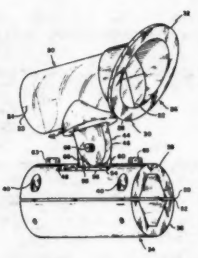
1. An puzzle apparatus. comprising:
a. a translucent curved member having a convex outer surface and a concave inner surface;
b. a plurality of translucent interlocking pieces, each of said plurality of interlocking pieces including a concave surface conforming to said convex outer surface of said curved member and a convex surface possessing indicia;
c. magnetic means for holding each of said plurality of interlocking pieces to said convex surface, said magnetic means comprising a multiplicity of opague strips of magnetic material and each of said plurality of interlocking pieces including magnetic material, said multiplicity of magnetic strips being placed in proximity to said convex outer surface of said curved member; and
d. source of light placed adjacent said curved member such that light from said source shines through said curved member, said multiplicity of opague strips forming a silhouette on said outer surface of said curved member in conjunction with said source of light.

4,884,812
GOLF CLUB HEAD
Yoichi Nagasaki; Itsushi Nagamoto; Toyohiko Tadokoro, and Masaki Fujimura, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan
Division of Ser. No. 821,029, Jan. 21, 1986, Pat. No. 4,798,383.
This application Oct. 11, 1988, Ser. No. 255,590
Claims priority, application Japan, Jan. 29, 1985, 60-015145; Sep. 9, 1985, 60-199034; Sep. 27, 1985, 60-214297
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—167 H **2 Claims**



1. An improved golf club head comprising:
a main body having a face side surface for shooting balls, said main body having an opening therethrough in the shooting direction, and
a FRP plate arranged in the face side region of said main body substantially parallel to said face side surface,
said FRP plate having a thickness less than the depth of said opening and closing said opening on the face side of said main body.

4,884,813
GOLF CLUB ALIGNMENT DEVICE AND METHOD
Glenn F. Cates, Rte. 2, Box 331-A, Fayetteville, Tenn. 37334
Filed Oct. 11, 1988, Ser. No. 255,598
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 D **10 Claims**



1. A device for recording a sight pattern determined by the relative position of the handle of a golf club shaft when held by a golfer addressing a ball comprising:
a sighting member having a longitudinal axis, top and bottom ends, and a plurality of spaced-apart indicators providing, when viewed from above, a predetermined sight pattern depicting alignment of said axis with the viewer's eyes;
means for securing said sighting member to said shaft in spaced-apart, generally parallel relation thereto;
said securing means including adjustable linkage means enabling movement of said sighting member so that its top may be pivoted closer to or further away from said shaft and said sighting member may be moved to the golfer's

left or right until said sight pattern is visible to the viewer; and

means for retaining said sighting member in adjusted position;

whereby the sighting member may be brought into a fixed position responsive to alignment of its axis with the viewer's eye and depicted by a predetermined sight pattern, location of the golf club handle for subsequent shots being reproducible by the golfer's movement of the handle until the predetermined sight pattern reappears when the sighting member is viewed by the golfer.

4,884,814

GOLF BALL

Michael J. Sullivan, Chicopee, Mass., assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Filed Jan. 15, 1988, Ser. No. 144,200

Int. Cl.[4] A63B *37/12;* **C08K** *3/14, 3/30;* **C08L** *33/02*

U.S. Cl. 273—235 R **26 Claims**

1. A golf ball comprising a core and a cover, wherein said cover comprises from about 25 to about 75 percent of a hard ionomer which is a sodium or zinc salt of the copolymer of an olefin having from 2 to 8 carbon atoms and an unsaturated monocarboxylic acid having from 3 to 8 carbon atoms, wherein said hard ionomer has a modulus of from about 30,000 to about 50,000 P.S.I. and from about 75 to about 25

percent of a soft ionomer which is a sodium or zinc salt of a terpolumer of an olefin having from 2 to 8 carbon atoms, an unsaturated monocarboxylic acid having from 3 to 8 carbon atoms, and an unsaturated monomer of the acrylate ester class having from 2 to 22 carbon atoms, wherein said soft ionomer has a modulus of from about 3,000 to 7,000 P.S.I.

4,884,815

EDUCATIONAL AUTOMOTIVE GAME METHOD OF PLAY

Willie L. Glenn, 917 Pine Oak Trail, Austell, Ga. 30001

Filed Apr. 27, 1988, Ser. No. 186,921

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—240 **1 Claim**

1. A method of playing an education automotive game comprising the steps of,

providing a playing board with a plurality of player positions designated passenger stations, a single player driver station, and an alphabet code translation station positioned centrally of said passenger and driver stations, and

providing a plurality of automotive license plate replica cards with respective representative automotive license plate sides positioned face down on a designated area of the drive station, and

providing a plurality of automotive question cards with an automotive related question set forth on one side of the question cards and said sides of said cards positioned face down on a further designated area of the driver station, and

wherein a further step designates a first participant as a driver and at least a plurality of further participants are designated as passengers, and

the driver subsequently selects a single automotive license plate replica card with a plurality of letters and a plurality of numerical digits thereon,

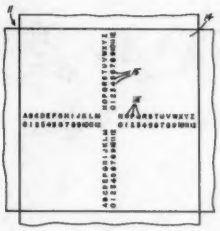
wherein a further step requires each passenger to utilize the code translation station to translate the numerical digits into corresponding alphabetic letters, and

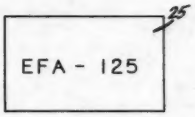
a further step requires each passenger to subsequently develop as many words as possible from the collections of said plurality of letters and translated numerical digits;

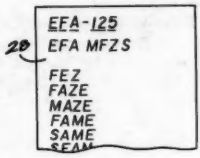
a further step requires said driver to subsequently select a question card and request a correct response from a winning passenger developing the greatest number of said words; and

awarding a point to said winning passenger upon correct response from said winning passenger to said driver presenting said winning passenger with said automotive question from said selected question card, and

wherein said driver upon selecting said single automotive license plate replica card utilizes a timing device to present said passengers with a preset time for developing as many of said words as possible, and







further including a step of deciding an ultimate winner of said game upon a respective passenger attaining a predetermined point to total, and

including the step of further playing of the game subsequent to a passenger attaining said preselected point total upon two or more passengers attaining said preselected point total simultaneously.

4,884,816

THESAURUS GAME APPARATUS

Kenneth R. Ford; Ellen L. Ford, both of 6260 - 16th St., S., St. Petersburg, Fla. 33705; Edward Nygren, and Joyce Nygren, both of 866 Placido Way, N., St. Petersburg, Fla. 33704

Filed Mar. 23, 1988, Ser. No. 172,211

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—240 **9 Claims**

1. An apparatus for playing a game to teach words, their meanings, and synonyms or equivalents thereof, comprising:

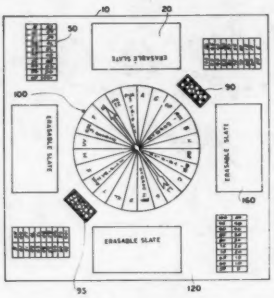
a plurality of game cards, said cards divided into four groups, each group of cards bearing a first indicia wherein said first indicia differs from group to group to visually distinguish each of said group of cards, each group of cards bearing second indicia further distinguishing the four groups, said second indicia dividing each card into six visually distinctive zones representing six selective subject categories wherein said second indicia defining each

group of cards as having six selective subject categories and that the six selective subject categories of one group of cards is different from the six selective subject categories of any other group of cards,

means for randomly selecting a game card comprising,

a circular dial face;

said dial face having a plurality of sections each said section bearing a first indicia and a second indicia corresponding



to a group of cards and a particular subject category in said group of cards;

a spinning pointer pivotally attached in the center of said dial face for randomly selecting a section;

a plurality of erasable answer slates;

a plurality of scoring boards;

a plurality of scoring disc holders;

a plurality of scoring discs.

4,884,817

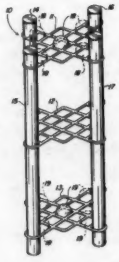
THREE DIMENSIONAL GAME AND GAMEBOARD

Terrence A. Johnson, 164 Palm Dr., Apt. 8, Naples, Fla. 33969

Continuation of Ser. No. 679,552, Dec. 7, 1984, abandoned. This application Apr. 26, 1989, Ser. No. 344,536

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—241 **5 Claims**



4. Apparatus for playing a three-dimensional game consisting essentially of

ten identical playing pieces, five of said pieces being of one color and the other five being of a different color, and

a gameboard of three similar boards lying in three spaced-apart parallel planes,

each board similarly containing a total of only 13 spaces, nine of which are arranged into three equally spaced lines of three spaces each to form a central matrix in the shape of a square with each one of the four remaining spaces being located outside the central matrix square and adjacent to the center of one of the four sides of the central matrix square, and

support means affixed to each of the three boards for maintaining the three boards in fixed spaced-apart relation to each other.

4,884,818

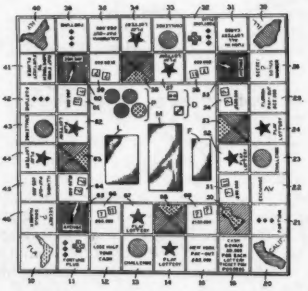
BOARD GAME APPARATUS

William M. Fogarty, 7601 N. Federal Hwy. #265, Boca Raton, Fla. 33487

Filed Jan. 31, 1989, Ser. No. 304,129

Int. Cl.[4] A63F *3/06*

U.S. Cl. 273—256 **19 Claims**



1. A board game apparatus comprising:

a game board having track means thereon with a series of playing positions in succession, at least one of said playing positions being a lottery-play position;

a plurality of game pieces for movement by respective players along said track means;

chance means for use by the players in turn to determine how far a player's game piece is to be moved after each turn of said player with said chance means;

a plurality of lottery tickets each having means thereon for a player to select a number when a player's game piece lands on a lottery-play position;

and a random number generator for producing a plurality of winning lottery numbers against which said player whose game piece is at a lotter-play position on the game board compares the selected numbers on that player's selected lottery tickets.

4,884,819

MULTI-DIMENSIONAL GAMES AND PLAYING BOARDS

W. Clark Lambert, 66 Plymouth St., Montclair, N.J. 07042

Continuation-in-part of Ser. No. 11,731, Feb. 6, 1987, abandoned. This application Apr. 15, 1988, Ser. No. 182,165

Int. Cl.[4] A63F *3/02*

U.S. Cl. 273—261 **25 Claims**

13. A game board comprising:

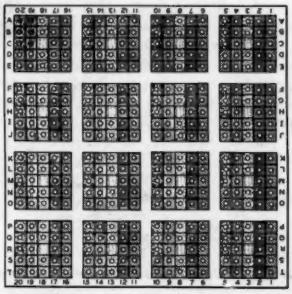
(a) a plurality of player spaces defining a playing area;

(b) a first playing field having no less than three (3) of said player spaces each having a specific relationship to each other arranged in at least one row of player spaces having no less than two player spaces each and at least one column of player spaces having no less than two player spaces each, at least one row of player spaces and at least one column of player spaces having a common player space;

(c) at least one column of spaced-apart playing fields one which includes said first playing field, each playing field in each column other than the first playing field having at least one player space; and

(d) at least one row of spaced-apart playing fields one which includes said first playing field, each playing field in each row except the said first playing field having at least one

player space each, at least one row of playing fields and one column of playing fields having a common playing field, and wherein the number of player spaces in any one



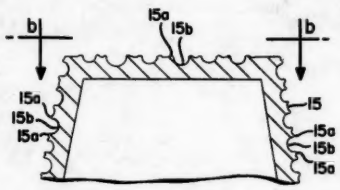
row of player spaces in any one field is not equal to the number of fields parallel to said any one row of player spaces.

4,884,820

WEAR RESISTANT, ABRASIVE LASER-ENGRAVED CERAMIC OR METALLIC CARBIDE SURFACES FOR ROTARY LABYRINTH SEAL MEMBERS

John E. Jackson, Brownsburg, Ind., and Norman L. Balmer, Ridgefield, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 19, 1987, Ser. No. 51,931
Int. Cl.[4] F01D *5/14;* F04D *29/08;* F16J *15/453*
U.S. Cl. 277—53 **23 Claims**



11. A blade comprising a tip surface adapted to cooperate with a sealing surface moving relative to the tip surface to inhibit gas flow between the sealing surface and the tip surface, said tip surface coated with a coating selected from the group comprising ceramic coatings and metallic carbide coatings; a plurality of substantially circular laser-formed depressions defined by land areas formed in the coated surface of said tip surface and said land areas providing a wear-resistant, roughened cutting area adapted for cutting into the sealing surface.

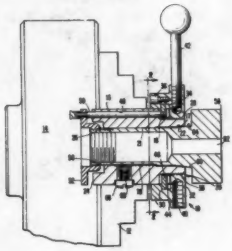
4,884,821

COLLET CHUCK

Otto E. Dietrich, 617 W. Jackson St., Morton, Ill. 61550

Filed Oct. 24, 1988, Ser. No. 261,542
Int. Cl.[4] B23B *31/20*
U.S. Cl. 279—1 A **13 Claims**

1. A collet attachment for a lathe for receiving a collet with a split, outwardly tapered first end and a second end spaced from said first end comprising a housing with an opening therethrough for receiving said collet and having a first housing end, said opening tapering outwardly at said first housing end, a second housing end spaced from said first housing end, a collar assembly means mounted on said first housing end for limited axial movement relative to said housing, flange nut means mounted at the second housing end for axial movement relative thereto, said flange nut means being adapted to releasably receive the second end of said collet when the split, outwardly tapered first end thereof is positioned adjacent to the first housing end, and elongated rod means extending axially of



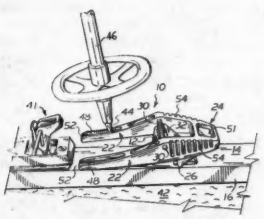
said housing for axial movement relative thereto, one end of said elongated rod means being secured to said collar assembly means and a second end of said elongated rod means extending outwardly beyond the second end of said housing and being secured to said flange nut means.

4,884,822

SKI SPURS

René P. Boisselle, 155, Deguire Blvd., Ville St-Laurent, Quebec, Canada H4N 1N9

Filed Jan. 27, 1989, Ser. No. 302,240
Int. Cl.[4] A63C *7/00*
U.S. Cl. 280—605 **7 Claims**



1. A ski spur for preventing a ski having an upper and a lower face interconnected by lateral sides from skidding backward, said spur comprising a supporting block member adapted to be secured on the upper face of the ski, said block member having an upper surface and a rear surface adapted to face the back of the ski, said upper surface being provided with a transversal groove and a rear surface being provided with an abutting surface means, a horseshoe-shaped member pivotally mounted about an axle extending through a transversal slot provided in said block member, said horseshoe-shaped member adapted to rotate between a substantially horizontal and a substantially vertical position, said horseshoe-shaped member having two legs adapted to laterally extend along the lateral sides of the ski, and a locking rod member extending between said legs adapted to releasably and resiliently snap into said transversal groove when said horseshoe-shaped member is in its substantially horizontal position with the legs projecting backwardly and to abut against said abutting surface means when said horseshoe-shaped member is in its substantially vertical position, said legs projecting below the lower surface of the ski, said slot being upwardly elongated in said block member, a compressible body disposed in said slot above said axle, said body adapted to urge said axle away from said trans-

versal groove when said locking rod member is positioned in said transversal groove.

4,884,823

STEERING WHEEL ASSEMBLY WITH AIR BAG

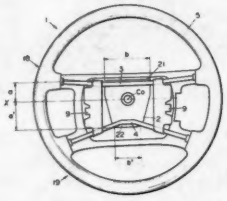
Kiyoshi Honda, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1987, Ser. No. 20,610

Claims priority, application Japan, Feb. 28, 1986, 61-44762; Feb. 28, 1986, 61-44768

Int. Cl.[4] B60R *21/22*

U.S. Cl. 280—731 **7 Claims**



1. A steering wheel assembly comprising:

a steering shaft;

a wheel ring;

support means supporting said wheel ring on said steering shaft;

an air bag device supported on said support means radially inwardly of said wheel ring;

said wheel ring having an upper half and a lower half which are positioned above and below, respectively, a transverse line passing through said steering shaft when said steering wheel is in a neutral position thereof; and

said support means having first support means supporting said upper half of said wheel ring and second support means supporting said lower half of said wheel ring, said first support means having a greater rigidity than that of said second support means.

4,884,824

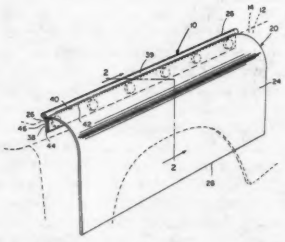
MAGNETIC FENDER COVER

Percy B. Radke, 1701-1th St. SW., Minot, N. Dak. 58701

Filed Jul. 7, 1988, Ser. No. 216,656

Int. Cl.[4] B60R *27/00*; B65D *65/02*

U.S. Cl. 280—770 **9 Claims**



1. A fender cover for covering at least an upper marginal portion of a fender and operable to exert at least a predetermined mechanical connection with said fender whose upper marginal portion includes a corner edge defining an integral depending mounting flange, said fender including a reasonably stiff and resilient pliant panel assembly having inner and outer side surfaces extending between opposite first and second marginal portions of said panel assembly, said first marginal portion being folded, along a fold zone, back over and closely opposing an underlying portion of said inner side surface, said first marginal portion including a free edge and being secured to the underlying portion of said panel assembly along a narrow path extending along said first marginal portion spaced closely adjacent said fold zone and an appreciably greater distance from said free edge, an outer portion of said first marginal disposed between said narrow path and said free edge being of sufficient width to form a surface gripping flange and being angularly displaceable, closely adjacent said path, up to 120° relative to the portion of said free marginal portion secured to said underlying portion of said panel assembly away from said underlying portion of said panel assembly, whereby said fender cover may be draped over said upper marginal portion of said fender with said outer portion of said first marginal portion defining said gripping flange overlying and extending along said mounting flange and the resiliency of said outer portion closely adjacent said path biasing said angularly displaced outer portion of said first marginal portion defining said gripping flange back toward a static position thereof generally paralleling the opposing portion of said panel assembly disposed closely adjacent and on the opposite side of said path for mechanical clamped engagement by said gripping flange and said opposing portion of said panel assembly with the portions of said fender extending along and disposed on opposite sides of said corner edge.

4,884,825

MEANS FOR ADJUSTING A BELT DEFLECTION FITTING FOR A SAFETY BELT

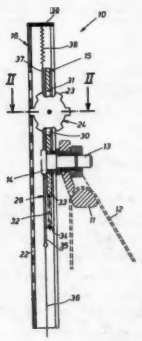
Hans-Joachim Grunewald, Kiebitzreihe, and Klaus-Peter Mennerich, Hamburg, both of Fed. Rep. of Germany, assignors to Autoliv GmbH, Elmshorn, Fed. Rep. of Germany

Filed Dec. 14, 1988, Ser. No. 284,354

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1987, 3742390

Int. Cl.[4] B60R *21/10, 22/20*

U.S. Cl. 280—806 **16 Claims**



1. Means for adjusting a belt deflection fitting for a safety belt, in particular the upper belt deflection fitting of a three-point automatic belt, comprising a holding profile on which the belt deflection fitting is guided displaceably with remote actuation and can be blocked in various shift positions,

wherein

on the holding profile a control member is displaceably guided,

on the control member a gear is rotatably mounted which continuously meshes with an immovable complementary engagement profile in the region of the holding profile, and

wherein

the belt deflection fitting is connected to a detent element blocking the gear o loading of the belt.

4,884,826

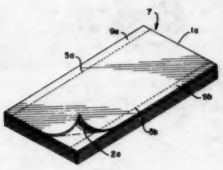
TRACING PAPER HAVING A REMOVABLE MARGIN OF PRESSURE SENSITIVE ADHESIVE

Elizabeth A. Slagsvol, P.O. Box 6495, Columbia, S.C. 29206

Filed Aug. 19, 1988, Ser. No. 234,351

Int. Cl.[4] B42D *1/00, 5/00, 3/18;* B32B *7/00*

U.S. Cl. 281—2 20 Claims



1. Tracing paper for copying graphic material which is present on an underlying surface comprising:

(a) a sheet of translucent material passing sufficient light for copying said graphic material on a surface of said sheet facing away from said underlying surface;

(b) a removable border along at least one edge of said sheet, said border being defined by said at least one edge and a tear line for separting said border from the remainder of said sheet, said tear line being disposed inwardly of and substantially parallel to said at least one edge; and,

(c) a pressure-sensitive adhesive covering at least a portion of said border on one side of said sheet for securing said sheet in a fixed position on said underlying surface, said pressure sensitive adhesive on said border permitting repetitive securing of said sheet on and removal of said sheet from said underlying surface, and said tear line providing means for easily separating the pressure sensitive adhesive coated border from the remainder of said sheet when the graphic material has been copied on said sheet.

4,884,827

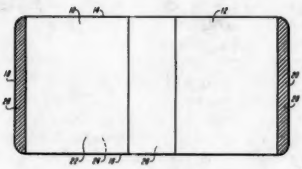
PARTIALLY TRANSPARENT LABEL

Thomas F. Kelley, Canton, Mass., assignor to Norfolk Scientific Inc., Norwood, Mass.

Filed Jan. 22, 1988, Ser. No. 146,965

Int. Cl.[4] B42D *15/00;* G09F *3/00;* B32B *23/00;* A61F *13/02*

U.S. Cl. 283—81 6 Claims



1. A label for identifying sample collection tubes without obscuring their contents, comprising:

a strip of plastic having first and second end portions, first and second substantially parallel edges, third and fourth substantially parallel edges which are substantially perpendicular to said first and second edges, a front surface, a rear surface, and a middle portion extending between said first and second edges and separating said first and second end portions,

said front surface being capable of receiving markings from a writing instrument on both of said end portions,

said rear surface having an adhesive material on at least one of said end portions and on said middle portion,

said middle portion being transparent,

each of said end portions being opaque, and having a dark band thereon adjacent said third and fourth edges respectively, to facilitate alignment of the ends of the label with each other.

4,884,828

SECURITY DOCUMENTS

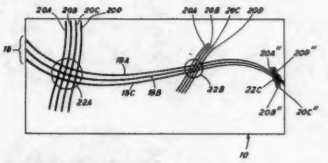
Audrey R. Burnham; Christopher J. Ewards, and Roger E. Munn, all of Oxfordshire, England, assignors to CMB Packaging (UK) Limited, Reading, England

Filed Feb. 4, 1988, Ser. No. 152,271

Claims priority, application United Kingdom, Feb. 18, 1987, 8703689

Int. Cl.[4] B42D *15/00, 15/02;* G02B *3/18;* G01B *11/14*

U.S. Cl. 283—89 21 Claims



1. A security document comprising a carrier which is printed with a plurality of line sets, each line set comprising a plurality of generally parallel lines, the thickness of each line of at least one line set varies progressively along its entire length, the line frequency of said at least one line set is varied to provide said at least one line set with a first area in which the lines of said at least one line set have a relatively high line frequency and are closely packed and difficult or impossible to distinguish with the naked eye, and a second area in which the lines of said at lest one line set have a relatively low line frequency and are sufficiently spaced to be individually seen.

4,884,829

PLUG-IN CONNECTION FOR CONNECTING TUBE AND HOST LINES IN PARTICULAR FOR USE IN TUBE-LINE SYSTEMS OF MOTOR VEHICLES

Hans G. Funk; Frank Neumann, and Dankmar Schäfer, all of Hungen, Fed. Rep. of Germany, assignors to Johannes Schaefer vorm. Stettiner Schraubenwerke GmbH & Co. KG, Hungen, Fed. Rep. of Germany

Filed Sep. 10, 1987, Ser. No. 95,958

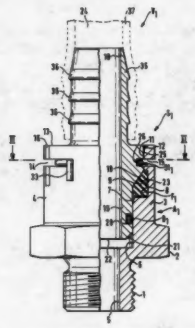
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1986, 3631460

Int. Cl.[4] F16L *35/10*

U.S. Cl. 285—24 19 Claims

1. In a plug-in connection for connecting tube and hose lines, comprising a male-part having thereon first means defining a clip-receiving, radially outwardly opening, locking groove, a female-part having second means thereon adapted to sealingly receive therein said male-part, said female-part having third means defining a radially inwardly opening cavity means thereon adapted to be radially aligned with said locking groove, a locking clip with legs, said legs of said locking clip being adapted to be received in both said cavity means in said female-part and said locking groove when radially aligned with each other, the improvement comprising each of said legs of said locking clip have fourth means defining an extension extending transversely to the longitudinal length of said leg, wherein said female-part has fifth means defining plural abutments in said cavity means adapted to engage and abut said

extensions, said abutments being oriented adjacent the peripheral surface of said female-part, radially outside the region whereat said extensions are located when said locking clip serves to lock said male-part to said female-part, said locking clip being supported on said female-part for radial movement relative to said female-part, said locking clip being made of elastically yieldable material, said extensions being oriented, in a relaxed condition of said locking clip, adjacent one another spaced from said abutments, surface means on said female-part for effecting a spreading apart of said legs on said locking clip in response to said locking clip being moved radially of said



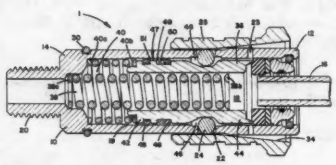
female-part whereby a radial movement of said locking clip relative to said female-part will cause said extensions and said legs to spread apart to bring said legs wholly out of said locking groove to thereby release the lock holding said male-part in said female-part and to thereby facilitate a relative axial movement between said male-part and said female-part, said extensions eventually coming into abutting relation with said abutments during a continued radial movement to thereby prevent said locking clip from being removed from its connected relationship with said female-part and said legs thereof from being further spread apart.

4,884,830

QUICK CONNECT COUPLING DEVICE

Stanlee W. Meisinger, Golden Valley, Minn., assignor to FasTest, Inc., St. Paul, Minn.

Filed Jan. 19, 1988, Ser. No. 146,037
Int. Cl.[4] F16L *21/04*
U.S. Cl. 285—94 **25 Claims**



1. A coupling device used in selectably coupling a first mechanism to a second mechanism in a fluid tight relationship wherein one of the first and second mechanisms provides a source of fluid pressure and the other a fluid pressure destination, the coupling comprising:

(a) a hollow body member having first and second ends and defining a fluid passageway interconnecting the first and second ends to enable the flow of fluid therethrough, the hollow body member having a wall portion with an interior surface defining a first chamber proximate the first end with an inside diameter sized to slideably receive the first mechanism, the hollow body member including at least one aperture extending through the wall portion and in communication with the first chamber;

(b) a gripping mechanism being disposed in the first chamber proximate the first end, the gripping mechanism being actuable between a first actuated state wherein the gripping mechanism grips the first mechanism and a second non-actuated state wherein the gripping mechanism does not grip the first mechanism;

(c) a cylindrical seal member disposed in the first chamber proximate the first end, said seal member being selectively positioned between a first sealing state and a second non-sealing state;

(d) an actuator means for selectively actuating the gripping mechanism between the actuated state and the non-actuated state, comprising:

(i) an actuator member disposed within the first chamber and axially slideable between a first position actuating the gripping mechanism and a second position nonactuating the gripping mechanism, the actuator member having an inner surface and an exterior surface;

(ii) biasing means for biasing the actuator member toward the first position;

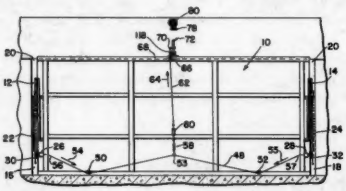
(iii) retaining means for selectively positioning the actuator member in a first and second position, the actuator member being substantially balanced in the longitudinal direction when the fluid passageway is pressurized.

4,884,831

AUXILIARY DOOR LOCK FOR A POWERED GARAGE DOOR

Randall S. Emon, 936 N. Martin St., Rialto, Calif. 92376

Filed Jun. 15, 1987, Ser. No. 61,974
Int. Cl.[4] E05C *9/24*
U.S. Cl. 292—38 **7 Claims**



1. A locking mechanism for a structure-mounted door having a power door-moving mechanism connected thereto by a drive link to provide opening and closing motion to the door, said mechanism including:

at lest one locking device positioned to releasably secure the door in a closed position to the structure,

locking device actuation means including:

a linear lost motion mechanism positioned between the door and the drive link which allows a limited linear motion therebetween,

means to sense said limited motion and to operatively connect said limited motion to said at least one locking device to open said locking device and release the structure from the door,

said linear lost motion mechanism including:

a bar member having:

a pivot connected to the door, said bar member positioned to extend therefrom toward the drive, and

a slot therein with an inner end positioned toward the door, and n outer end positioned toward the drive link, and

a pair of fasteners connected to the drive link and extending through said slot, said fasteners being spaced from each other a distance less than the distance between said inner

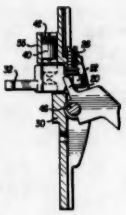
and outer ends of said slot so that said fasteners can allow said limited linear motion between the door and the drive link.

4,884,832

HEAT TRIGGERED DOOR JAMMING MECHANISM

Kevin O. Bungard, Rockwood, Pa., assignor to Rockwood Manufacturing Company, Rockwood, Pa.

Filed Sep. 22, 1988, Ser. No. 247,516
Int. Cl.[4] E05C *1/14*
U.S. Cl. 292—173 9 Claims



1. A push-actuated door opener, for use on a door, comprising:

a base plate for attachment to a door;

an elongated axially moveable bolt which, when pulled into the door, allows it to open;

a push lever having a projection and a handle and means pivotally connecting the push lever to the base plate;

an operating lever having a cavity of a predetermined depth and means pivotally connecting the operating lever to the base plate, the operating lever further having a return position and being connected to the projection of the push lever on the base plate such that the operating lever rotates out of the return position to pull the bolt into the door when the push handle is pressed;

means for urging the operating lever to the return position;

a locking pin which is longer than the depth of said cavity in the operating lever, the locking pin being held in the base plate opposite the cavity and means biasing the locking pin toward the cavity; and

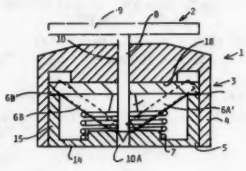
a fusible link pin, connected to the base plate and positioned to retain the locking pin in the base plate out of the cavity when said fusible link pin has not been exposed to a high temperature but permitting said locking pin biasing means to move said locking pin when exposed to a high temperature.

4,884,833

LOCKING DEVICE

Palle Pedersen, Soester Svenstrup, Byvej 5, 4130 Viby Sjaelland, Denmark

Filed Sep. 30, 1988, Ser. No. 251,879
Int. Cl.[4] B65D *33/34*
U.S. Cl. 292—316 10 Claims



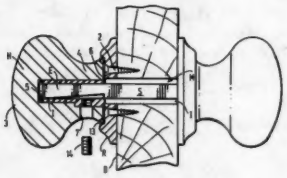
1. Locking device, preferably for releasable attaching a plastic wafer to articles providing security against the theft thereof and which device comprises a locking mechanism mounted in a house and intended to be attached to the wafer, and a pin member, preferably with a smooth surface, interacting with the locking mechanism characterized in that the locking mechanism comprises two locking plates (*6a,6b*) each having a long side (*11a,11b*) adjacent each other, each adjacent long side is provided with a centrally placed recess (*12a,12b*) for engagement with the shaft (8) of the pin (2), an inner house part (5) providing inclined planes (*16a,16b*) directed symmetrical against the centre line of the house, separation means (17) provided at the centre line of the house and shaped to separate the locking plates (*6a,6b*), when these abut against the inclined planes (*16a,16b*) in their position (*6a,6b*) for release of the pin (2), and spring means (7) biasing the locking plates against their position (*6a,6b*) for locking of the pin.

4,884,834

DOOR AND HANDLE ASSEMBLY

Ozcan Ozagir, Bolton, and Raymond Proffitt, Manchester, both of Great Britain, assignors to Celmac Limited, Manchester, England

Filed Mar. 9, 1988, Ser. No. 165,948
Claims priority, application United Kingdom, Mar. 13, 1987, 8705981; Mar. 13, 1987, 8705982
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—350 4 Claims



1. A door having a hole therethrough; a spindle including a tapered longitudinal portion extending through the hole; a rose secured to the door about the hole; and a handle of a ceramic material secured to the spindle, and comprising a body portion and a neck portion having a free end wall, a socket extending from the free end wall towards the body portion, a first hole extending transversely through the neck portion and into the socket, an elongated insert formed of a plastics material received within the socket between the handle and the spindle, the insert including sidewalls and a flange abutted against the free end wall to prevent abrasive rubbing between the end wall and the rose, a second hole which is threaded and extending through a sidewall of the insert in alignment with the first hole and a threaded member extending through the aligned holes to bear on the tapered longitudinal portion of the spindle.

4,884,835

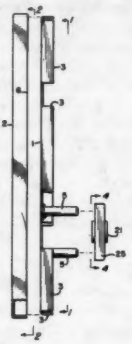
LEVER SPINDLE SPRING CAGE

Jon M. Smallegan, Colorado Springs, Colo., and Richard R. Bettger, San Francisco, Calif., assignors to Schlage Lock Company, San Francisco, Calif.

Filed Aug. 31, 1988, Ser. No. 238,408
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—357 1 Claim

1. A lever spindle spring cage mounting comprising: a spring means; a means for mounting said spring means relative to a lock means; said spring means being further provided with a means for accepting a lock spindle, the spring mounting means further comprising a plurality of pin means; said pin means being inserted in a lock mounting in a radial orientation about the axis of rotation of a lock spindle; said plurality of mounting pins being further disposed in a plurality of keyhole mounting means; and said pin means further cooperating with radially

disposed holes in said spring cage for aligning said spring cage relative to said lock mounting means; and said lock mounting



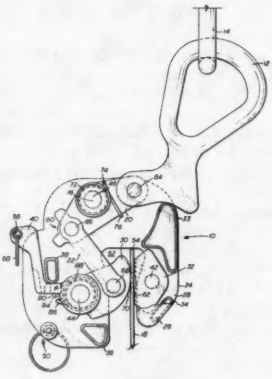
means and said mounting pins and said spring means further cooperate to radially orient and diametrically fix the spring means about the axis of said spindle means.

4,884,836

PLATE LIFTING CLAMP

David Maye, West Hempstead, and Moon Choung, Melville, both of N.Y., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 9, 1988, Ser. No. 230,815
Int. Cl.[4] B66C *1/48*
U.S. Cl. 294—101 **12 Claims**



1. A clamp for a work piece, comprising:

a body having opposing jaws for gripping the work piece therebetween;

linkage disposed on said body for rotating at least one of said jaws between an open position where said one of said jaws does not engage the work piece and a closed position where said one of said jaws does engage the work piece;

an operating member rotatably disposed on said body and engageable with said one of said jaws, said member being rotatable between a retracted position where said member does not engage said one of said jaws and an engaged position where said member engages said one of said jaws;

means for biasing said operating member to said retracted position;

locking means for positively locking said operating member in said engaged position and preventing said operating member from rotating to said retracted position by said biasing means; and

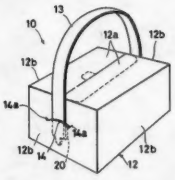
said operating member rotating said one of said jaws to said open position and actuating said locking means to positively lock said operating member in said engaged position as said operating member is rotated to said engaged position.

4,884,837

HANDLE FITTING STRUCTURE FOR PACKAGING BOX

Masahiro Nakazawa, Tokyo, Japan, assignor to Kabushiki Kaisha P C Planning, Shinjuku, Japan

Filed Apr. 28, 1988, Ser. No. 187,207
Claims priority, application Japan, Aug. 3, 1987, 62-119560
Int. Cl.[4] B65D *5/46*
U.S. Cl. 294—158 **6 Claims**



1. A handle fitting structure for a packaging box which has a box body having side walls and a band-like handle attached to said box body by engaging both tips thereof with said side walls of said box body, said fitting structure comprising:

insertion slit means for inserting said tips of said handle therethrough and engaging thereto, said insertion slit means including a curved incision having a length greater than a width of said handle and provided at each of two facing side walls of said box body;

insertion guide means for serving as a guide at the time of inserting said tips of said handle into said insertion slit means, and said insertion guide means being extended protrusively in a first direction on each of said tips of said handle; and

engaging means for engaging with a curved upper edge of said curved incision when each of said tips of said handle is inserted into said insertion slit means, and said engaging means being provided on each of said tips of said handle in a direction opposite to said first direction of said insertion guide means and having a curved tip end such that said box body is swingably supported by said handle by the engagement of said curved tip end of said handle with said curved upper edge of said incision of said box.

4,884,838

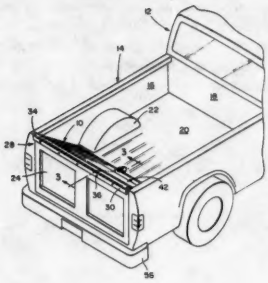
COMBINED AIR FOIL AND LOADING RAMP FOR PICKUP TRUCK

Frank W. Slater, P.O. Box 186, Durant, Okla. 74702

Filed Jan. 13, 1989, Ser. No. 296,781
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—180.1 **9 Claims**

1. A combined air foil and loading ramp for a pickup truck having a tailgate pivotally movable between a vertical, closed position and an open position comprising a bracket positioned on the upper edge of the tailgate, means securing the bracket to the tailgate for movement therewith, a rigid panel, means connecting the panel to the bracket for positioning the panel in a downwardly and forwardly inclined position with the free

edge of the panel terminating adjacent the floor of a loadbed of a pickup truck to form an air foil when the tailgate is in vertical



position, said panel forming an extension of the tailgate surface when the tailgate is in open position to form a loading ramp.

4,884,839

CO-EXTRUDED TEMPORARY SEAT COVER FOR NEW VEHICLES

Paul C. Keiswetter, 431 Michigan Ave., Charlevoix, Mich. 49720

Continuation-in-part of Ser. No. 784,817, Oct. 4, 1986, Pat. No. 4,676,376. This application Mar. 2, 1987, Ser. No. 20,026
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] A47C *31/00*; B65D *65/02*; B32B *7/02*
U.S. Cl. 297—219 **10 Claims**

1. An easily removable temporary plastic seat cover for protecting a new automobile-type vehicle seat having seating and backrest portions, wherein a frame on the underside of the seat is first covered with the seat cover and subsequently secured to a support means in bearing engagement with at least one portion thereof, the seat cover comprising a bag that fits over the front of the seat and extends over the top of the seat and under the frame, the seat cover including at least one opening in the underside thereof that surrounds the portion of the frame that is in bearing engagement with the support means, such that the seat cover is not pinched between the seat frame and support means when they are secured together, the seat cover being tearable to remove the seat cover from the seat, the opening permitting removal of the entire seat cover, without a portion of the seat cover being retained in the area of bearing engagement between the seat frame and the support means, the seat cover being formed of a co-extruded plastic material wherein inside and outside surface layers are formed of two different plastic materials having different coefficients of friction, the ouside surface being relatively slippery compared with the inside surface, the outside surface layer being formed of high-density polyethylene and inside surface layer being formed of linear low-density polyethylene.

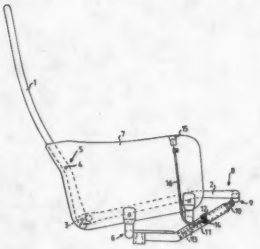
4. A temporary plastic seat cover for protecting an automobile-type vehicle seat having seating and backrest portions, the seat cover fitting over the seat so as to at least cover the seating portion of the seat, the seat cover being formed of a co-extruded plastic material wherein inside and outside surface layers are formed of two different plastic materials having different coefficients of friction, the outside surface layer being relatively slippery compared with the inside surface layer, the outside surface layer comprising high-density polyethylene.

4,884,840

ARRANGEMENT IN ADJUSTABLE SEATS

Ake Linden, and Roger Gustafsson, both of Vetlanda, Sweden, assignors to Möbelteam AB, Sweden

Filed Jan. 18, 1989, Ser. No. 298,409
Claims priority, application Sweden, Jan. 18, 1988, 8800146
Int. Cl.[4] A47C *1/02, 1/027, 1/032*
U.S. Cl. 297—320 **8 Claims**



1. An adjustable seat, comprising:

a substructure, said substructure having a lower part;

arm rests attached to said substrate, said arm rests having rear portions;

a back support pivotably connected to said rear portions of said arm rests;

a seat part pivotably joined to said back support, said seat part having a front portion and an underside;

a fixed locking sleeve projecting out from said lower part of said substructure, said fixed locking sleeve having a hole through its surface;

a slide bar extending from said seat part, said slide bar being pivotably connected to said front portion of said seat part on said underside of said seat part, said slide bar being disposed in the longitudinal direction of said seat part, said slide bar being telescopically displaceable and lockable in said fixed locking sleeve in one of at least two predetermined, distinct, locking positions within said locking sleeve to adjust the mutual angular positions of said back support and said seat part to a setting desired by a user, said slide bar having a bore therein, said bore of said slide bar being registrable with said hole of said fixed locking sleeve; and

a locking pin which can be thrust into said hole of said fixed locking sleeve for coaction with said bore of said slide bar when said hole is registered with said bore to lock said slide bar and said fixed locking sleeve in said one of at least two predetermined, distinct, locking positions within said locking sleeve.

4,884,841

SEATING ASSISTANCE DEVICE

Robert E. Holley, P.O. Box 1669, Angleton, Tex. 77515

Filed Jun. 20, 1988, Ser. No. 209,063
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—331 **31 Claims**

1. A device for assisting an individual with a weakened lower body condition into and from a seated position, comprising:

a frame;

a seat member adapted to support the weight of the individual seated thereon, said seat member generally defining a longitudinal center of gravity;

hinge means connected to said seat member adjacent to an end thereof forward of said center of gravity for pivoting a rearward portion of said seat member upwardly with respect to a forward portion thereof;

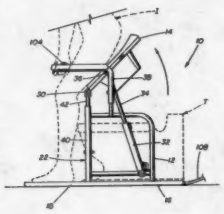
stop means operatively associated with said hinge means for

preventing said rearward seat member portion from pivoting below a horizontal attitude;

means for supporting said hinge means on said frame, said support means being vertically slidable between uppermost and lowermost positions;

extendable arm means pivotally connected to said seat member forward of said center of gravity for releasably urging said seat member vertically upward; and

control means for activating said arm means to raise said seat member in a horizontal attitude with said support means



sliding from said lowermost position to said uppermost position, and with said support means in said uppermost position, to pivot said seat member about said hinge means to elevate said rearward seat member portion relative to said forward seat member portion, and for deactivating said arm means to pivot said elevated rearward seat member portion about said hinge member into a horizontal attitude with said support means in said uppermost position, and with said seat member in said horizontal attitude to lower said seat member with said support means sliding from said uppermost position to said lowermost position.

4,884,842

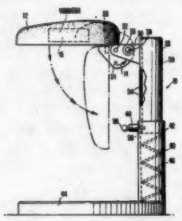
BODY SUPPORTING CHAIR

Sarah Finkelstein, 826 Robert E. Lee Blvd., Charleston, S.C. 29412

Filed Aug. 8, 1988, Ser. No. 229,451

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—331 **16 Claims**



1. A body supporting chair comprising only a seat member of generally U-shaped configuration defined by an arcuate rear portion and a pair of side portions, said seat member having a bottom surface, a seat support segment plate associated with said bottom surface of said seat member substantially at the center of said arcuate portion for supporting said bottom surface, upstanding swivel means projecting upwardly from said segment plate and being associated with said bottom surface about which said seat member is adapted to pivot in a horizontal plane from side to side about the vertical axis through said swivel means, flange means for securing said seat member with respect to a seat support member, said seat support member being adapted to support said seat member above a generally horizontal support surface, said segment plate being adapted for rotation with respect to said flange means such that said seat member may assume an operative position wherein said seat member lies generally perpendicular to said support member, and an inoperative position wherein said seat member lies generally parallel to said support member, seat locking means for positively securing said seat member in said operative position, support locking means associated with said support member for securing said seat member at any one of a plurality of closely spaced heights above said horizontal support surface.

4,884,843

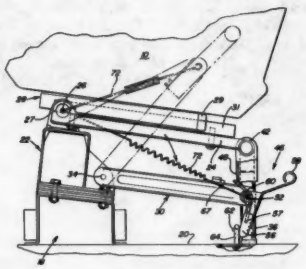
SEAT TILT MECHANISM

Delbert D. DeRees, Romeo, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 21, 1989, Ser. No. 341,382

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—331 **2 Claims**



1. In combination with a vehicle seat supported on a vehicle flooring structure and having a support member pivotally secured to a support for movement of the rear of said seat about a substantially horizontal tilt axis at the front of said seat to and between a first position at which the rear of the seat is raised to an access position and a second position at which the rear of the seat is lowered to a seating position, the improvement comprising:

a toggle having a first link, a second link pivotally secured at a first end to a first end of said first link, a second end of said first link being pivotally secured to a support eccentric from said tilt axis, a second end of said second link being pivotally secured to the support member about a support axis positioned rearwardly of said tilt axis, wherein said first position is defined by said first and second ends of said first and second links being substantially linearly aligned;

means for fixedly positioning said first and second links to retain said seat in said second position; and

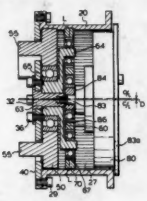
a leg structure pivotally secured at the rear of said seat about said support axis, the leg structure including a leg the upper portion of which defines the second link, the entire leg structure rotating with the second link to a position engaging the vehicle flooring structure when the seat is lowered to a seating position and rotating to a position generally aligned with the toggle when the seat is raised to an access position.

4,884,844

DOUBLE STAGE TAUMEL GEAR REDUCTION UNIT

Peter Kershaw, London; Beo Meixner, Oshawa, and Gordon Olmstead, London, all of Canada, assignors to Magna International Inc., Markham, Canada

Filed Aug. 31, 1988, Ser. No. 238,396
Claims priority, application Canada, Sep. 1, 1987, 545846
Int. Cl.[4] B60N 1/06
U.S. Cl. 297—362 58 Claims



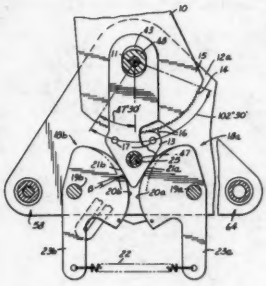
1. A modular taumel reduction device comprising a housing having an exterior surface, interior surface and at least two ends, the housing having an opening extending from end to end along a first axis of extension through the opening of the housing, the housing having mounting means disposed proximate the exterior surface thereof, the interior surface of the housing having a multiplicity of detent means disposed thereupon, the housing having disposed at one end thereof driving means extending at least partially into the opening of the housing, the driving means having first engagement means extending therefrom proximate the housing for engagement with a first driven means, the first driven means being contained within the housing and having compatible detent means disposed about its perimeter for communication with the detent means disposed on the interior surface of the housing, the first driven means having fewer numbered compatible detent means than those disposed upon the interior surface of the housing or being smaller in diameter than said opening of said housing, the first driven means having second engagement means extending therefrom in a direction substantially parallel to the extension of the first engagement means, the second engagement means for engagement with a second driven means, the second driven means being contained within the housing having compatible detent means disposed about its perimeter for communication with the detent means disposed on the interior surface of the housing, the second driven means having fewer numbered compatible detent means than those disposed upon the interior surface of the housing or being smaller in diameter than said opening of said housing, the second driven means having third engagement means extending therefrom in a direction substantially parallel to the extension of the first and second engagement means, the third engagement means for engagement with at least a third driven means or a moveable frame or lever; whereby when the driving means drives the first engagement means to engage the first driven means such engagement will result in the wobbling of the first driven means within the housing as the detent means of the first driven means intermittently engages the detent means upon the interior of the housing, such intermittent engagement being predetermined to effect a reduction in the speed of the first driven means with respect to the driving means, the first driven means thereby driving the second engagement means thereof to engage the second driven means, such engagement resulting in the wobbling of the second driven means within the housing as the detent means of the second driven means intermittently engages the detent means upon the interior of the housing, such intermittent engagement being predetermined to effect a reduction in the speed of the second driven means with respect to the first driven means, the second driven means thereby driving the third engagement means thereof to engage at least a third driven means, a moveable frame, or lever at a substantially reduced output speed to that of the speed of the driving means.

4,884,845

CONTINUOUSLY VARIABLE ADJUSTABLE HINGE

Gerhard Schmale, 5609 Huckeswagen, Jung-Stilling-Str. 68; Frank Gerich, 5630 Remscheid, Strucker Str. 67, both of Fed. Rep. of Germany, and Rudolph C. Barda, 60 Brookfield Ct., Battle Creek, Mich. 49015

Continuation-in-part of Ser. No. 237,713, Aug. 29, 1988, abandoned. This application Mar. 20, 1989, Ser. No. 324,969
Int. Cl.[4] A47C 1/026; B60N 1/06
U.S. Cl. 297—367 33 Claims



1. Assembly of pivotally connected elements characterized by continuously variable adjustment means for locking the relative angular relation of said elements comprising, toothed convex circular arc sector means on one of said elements and matching interengageable toothed means on the other of said elements, mounting means for said other toothed means accommodating complete disengagement of said respective toothed means during adjustment of said relative angular relation, said mounting means including means for accommodating full matching tooth engagement of said respective toothed means for any continuously variable adjustable angular relation of said elements, and cam means on said other of said elements engageable with said other of said toothed means after establishing full matching engagement of said respective toothed means for locking said respective toothed means against any relative displacement in said relative angular relation of said elements, said assembly being further characterized by said mounting means for said other of said toothed means including a pivotal connection coaxial with the pivot of said pivotally connected elements, said pivotal connection having radial displacement clearance to accommodate said disengagement.

4,884,846

ARM CHAIR, PARTICULARLY OFFICE ARM CHAIR, WITH ADJUSTABLE ARM RESTS

Peter Tobler, St. Margrethen, Switzerland, assignor to Equus Marketing Corp., Wald, Switzerland

Filed Sep. 8, 1988, Ser. No. 242,033
Claims priority, application Switzerland, Sep. 14, 1987, 3534/87
Int. Cl.[4] A47C 7/54
U.S. Cl. 297—411 6 Claims

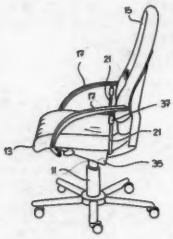
1. Arm chair, particularly office arm chair comprising
a seat (13);
a chair back located at a rearward portion of the seat;
and arm rests (17) located laterally of the seat at a position which is elevated with respect to the seat,
said arm rests extending, from a position adjacent the chair back, downwardly towards the front portion of the seat;
pivotable coupling means (25) pivotably connecting respec-

tive forward portions of the arm rests to the front portion of the seat,

wherein said pivotable coupling means comprises a brace element (27) secured to the seat, and a pivot connection (25) between the arm rest and said brace element, the position of said brace element laterally with respect to the seat being adjustable;

support means (21) coupling the arm rests to the seat positioned in the vicinity of the back rest (15) or the rearward portion of the seat, the position of the support means laterally with respect to the seat being adjustable,

wherein the support means comprises a pair of elongated support rod elements, one rod element having a right-handed thread (51) formed thereon and the other rod element having a left-hand thread (53) formed thereon,



and a positioning element (37) having, respectively, right and left-hand threads for engagement with the right and left-hand thread of the support rod elements and for, respectively, separating or approaching the support rod elements to thereby adjust the effective length of said support means; and

pivot means (21*a*; 33) for connecting said support means (21) to a rearward portion of the seat while permitting deflection of the support means towards and away from the chair back, and

wherein said support means (21) are length-adjustable so that the elevational distance between the arm rests and the seat can be adjustably determined.

4,884,847

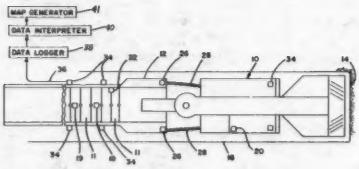
APPARATUS AND METHOD FOR MAPPING ENTRY CONDITIONS IN REMOTE MINING SYSTEMS

Stephen L. Bessinger, Morgantown, W. Va., and Michael G. Nelson, Bethel Park, Pa., assignors to Consolidation Coal Co., Pittsburgh, Pa.

Filed Feb. 19, 1988, Ser. No. 157,773

Int. Cl.[4] E21C *35/08*

U.S. Cl. 299—1 **8 Claims**



1. Method of mapping strata and profile conditions in a mine, tunnel, or excavation entry through the use of a self propelled vehicle transportable in the entry comprising

a. placing an array of sensors on the vehicle to develop knowledge of entry conditions;

b. placing instrumentation on the vehicle to develop knowledge of location of the vehicle in the entry;

c. collecting said knowledge of entry conditions and vehicle location;

d. generating a survey map of the entry conditions indicative of a given location of the vehicle;

e. storing said knowledge; and,

f. comparing said generated survey map with another similarly generated survey map to develop a history of change in entry conditions.

4,884,848

DEVICE AND METHOD FOR EXPLOITING MATERIAL

Herwig Wrulich, Zeltweg; Hubert Weissensteiner, Knittelfeld, and Bernward Bruns, Obdach, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

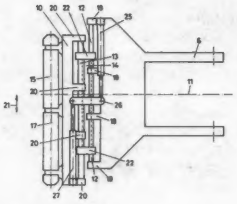
PCT No. PCT/AT87/00074, § 371 Date Aug. 22, 1988, § 102(e) Date Aug. 22, 1988, PCT Pub. No. WO88/04354, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 4, 1987, Ser. No. 251,706

Claims priority, application Austria, Dec. 5, 1986, 3251/86; Feb. 17, 1987, 341/87

Int. Cl.[4] E21C *25/08, 47/00*

U.S. Cl. 299—73 **9 Claims**



1. A device for exploiting rock material, comprising:

a chassis;

a cantilever arm having one end pivotally mounted on the chassis by a swivel joint, for swivelling about a horizontal axis transverse to the length direction of the arm, said arm also having a free end;

means connecting between said chassis and said arm for swivelling said arm about said swivel joint;

said free end of said arm mounting a head which is broader than said arm;

a plurality of rotary excavating tools arranged in a series extending transversally of said arm and arranged to rotate about horizontal axes extending transversally of said arm, said excavating tools being equipped with excavator bits;

means supporting said rotary excavating tools on said head of said arm for vertical swivelling movement with said arm about said swivel joint;

said supporting means providing for selective shifting of said rotary excavating tools transversally of said length direction of said arm, by including:

a tool carrier on which said rotary excavating tools are mounted for rotation;

said tool carrier having at least three bearing eyes spaced therealong transversally of said arm;

at least three bearing eyes provided on said head and spaced therealong transversally of said arm;

an intermediate carrier having two sets of at least two bearing eyes;

the bearing eyes of the tool carrier mounting a guide rod on which one set of the bearing eyes of the intermediate carrier are received for sliding movement transversally of the arm;

the bearing eyes of the head mounting a guide rod on which the other set of the bearing eyes of the intermediate carrier are received for sliding movement transversally of the arm;

said bearing eyes of said tool, said bearing eyes of said head, and said bearing eyes in each set on said intermediate carrier all being spaced approximately equal distances apart transversally of said arm;

first means mounted between the intermediate carrier and the head for sliding the intermediate carrier transversally of the arm; and

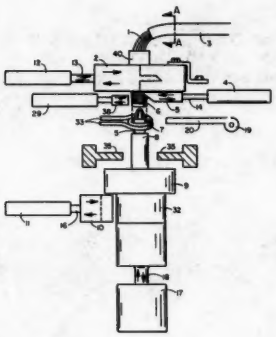
second means mounted between the tool carrier and the intermediate carrier for sliding the tool carrier transversally of the arm.

4,884,849

APPARATUS FOR MANUFACTURE OF END BRUSH

Richard J. Shaw, Hartland, Wis., assignor to Better Health Concepts Co Inc., Milwaukee, Wis.

Filed Dec. 12, 1988, Ser. No. 283,089
Int. Cl.[4] A46D 3/04
U.S. Cl. 300—4 **6 Claims**



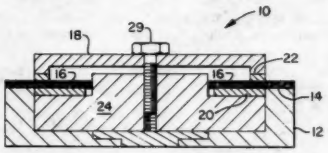
1. Apparatus for manufacture of end brush wherein the improvement comprises: a fiber feed guide eye for fiber skein feeding said fiber skein into an aperture of fiber bundle adjustable aperture plate and closing said aperture around said fiber bundle in said adjustable aperture plate, and means for heating a tapered splined male pin in contact with the bottom of said fiber bundle and means to push said heated tapered splined male pin into the bottom of said fiber bundle comprising a compression spring on a splined head shaft flanged base, and means to cool said tapered splined male pin, extending into said fiber bundle to solidify the melted fiber bundle, and opening said aperture to draw out the fiber bundle attached to said tapered splined pin, and a fluid power cylinder actuated fiber bundle cutter blade to cut said fiber bundle drawn out of said aperture, and said fiber bundle attached to said tapered splined pin withdrawn into a splined pin shaft guide sleeve to strip the so formed end brush from said tapered splined pin and means to drive said end brush off the top of said splined pin shaft guide sleeve, said means comprising a fluid power cylinder to actuate a brush knock off hammer.

4,884,850

METHOD AND APPARATUS FOR MANUFACTURING COMPLIANT BRUSH SEALS

John Greer, Burlington, Canada, assignor to Pratt & Whitney Canada, Inc., Longueuil, Canada

Filed Aug. 30, 1988, Ser. No. 238,082
Int. Cl.[4] B23Q 3/00
U.S. Cl. 300—21 **3 Claims**



1. A method of manufacturing a compliant seal having a plurality of bristle elements secured to an annular backing member and extending radially into contact with a rotating shaft, comprising the steps of:

providing a first annular aligning member having an annular flat surface, the surface having a plurality of generally radially extending grooves disposed therein, said grooves being evenly distributed about the circumference of the surface,

placing a predetermined plurality of bristle elements within each groove, the bristle elements extending from the corresponding groove and being aligned therewith.

sandwiching a portion of the bristle elements extending from the grooves between first and second annular backing rings,

releasably securing the placed bristle elements between the annular backing rings by clamping the rings between first and second holding members,

permanently securing said bristle elements to said backing rings, and

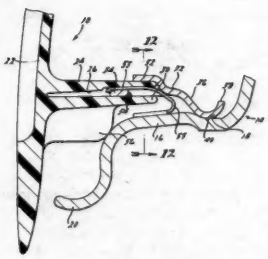
releasing the backing rings and bristle elements from the first and second holding members.

4,884,851

WHEEL TRIM RETENTION

Heinrich J. Hempelmann, and Eugene M. Pruss, both of Livonia, Mich., assignors to NI Industries, Inc., Novi, Mich.

Filed Jan. 28, 1988, Ser. No. 149,646
Int. Cl.[4] B60B 7/00
U.S. Cl. 301—37 PB **13 Claims**



1. A wheel trim adapted for removable engagement with a wheel rim having an annular generally axially disposed flange portion and an annular safety groove, said wheel trim comprising:

trim means defining an outwardly facing ornamental surface;

an axial flange connected to said trim means and normally extending axially inwardly toward the wheel rim;

groove means defining an annular groove in the axially inner end of said axial flange;

a continuous retention band having a first end disposed in said groove means and a second end normally extending axially inwardly toward the wheel rim, said band including a plurality of circumferentially spaced tabs normally extending radially inwardly and axially outwardly into radially overlying relationship with a radially inwardly facing surface of said axial flange, each said tab being disposed partially about said axially inner end of said axial flange to strengthen the assembly; and

retaining means on said retention band normally removably engaging said safety groove to releasably retain said wheel trim on said wheel rim.

4,884,852

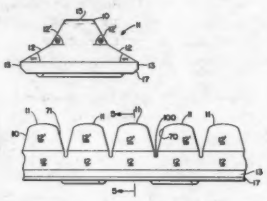
DOUBLE V-SHAPED ENDLESS TRACK DRIVE SYSTEM

John W. Edwards, Brandon; Daniel R. Harper, and Quinton B. McNew, both of Ft. Myers, all of Fla., assignors to Edwards, Harper, McNew & Company, Ft. Myers, Fla.

Continuation-in-part of Ser. No. 113,670, Oct. 28, 1987, which is a continuation-in-part of Ser. No. 49,819, May 14, 1987, and Ser. No. 51,830, May 20, 1987. This application Oct. 25, 1988, Ser. No. 261,933

Int. Cl.[4] B62D *55/18*

U.S. Cl. 305—35 EB **33 Claims**



1. An endless drive track comprising:

a plurality of endless track drive members, each said drive member including a first lateral frictional drive face sloping inwardly with respect to a transverse direction of said endless drive track at a first angle with respect to horizontal and a second lateral frictional drive face sloping inwardly with respect to said transverse direction of said endless drive track at a second angle with respect to horizontal; and

means for connecting said drive members to one another to form said endless drive track.

4,884,853

DRAWER INTERLOCKING MEANS FOR STORAGE CABINET

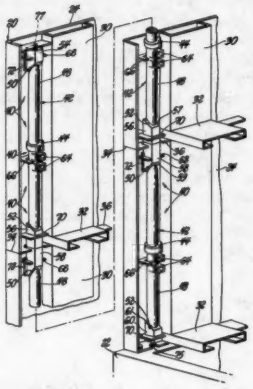
Stephen M. Bowyer, Fruitport, Mich., assignor to Meridian, Inc., Spring Lake, Mich.

Filed Jul. 28, 1988, Ser. No. 225,351

Int. Cl.[4] E05C *7/06*

U.S. Cl. 312—221 **30 Claims**

1. A storage assembly comprising: housing means (20) defining an enclosure, a plurality of storage units (38) to be supported by said housing means (20) for movement between a closed position within the enclosure and an open position extending out of said housing means, and blocking means (40) disposed along side of said storage units (38) for preventing opening movement from said closed position of all but one of said storage units (38) in response to opening movement of said one of said storage units (38), said blocking means (40) including control means (42) associated with each storage unit (38) movable between a neutral position allowing opening movement of said storage unit and a blocking position preventing opening movement of said storage unit from said closed position and for remaining in said neutral position during installation of any number of storage units from their open position to



their closed position while allowing opening movement of one installed storage unit (38) from its closed position moving all other control means to said blocking position preventing opening movement of all other associated storage units (38).

4,884,854

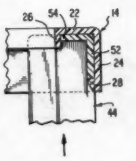
INTERCONNECTING PANELS FOR KNOCKDOWN STRUCTURES

Edward J. Joffe, 940 Park Ave., Linden, N.J. 07036

Filed Mar. 16, 1989, Ser. No. 324,464

Int. Cl.[4] A47B *58/00*

U.S. Cl. 312—257.1 **7 Claims**



1. A knockdown cabinet construction of the type having a set of first frame members forming two opposite sides of the cabinet and, detachably connectable thereto, a set of second frame members forming two other opposite sides of the cabinet, each of the first and second frame members having a principal face forming the corresponding cabinet side, characterized in that:

each first frame member includes a pair of side rails extending the height thereof, each side rail having a first planar wall extending in the principal face of said member, a second planar wall extending perpendicular to said first wall at the lateral edge thereof, a third planar wall extending perpendicular to said first wall and in spaced parallel relation to said second wall, said second wall having a plurality of wedge-shaped projections at spaced intervals at the free lateral edge thereof and extending toward said third wall; and

each second frame member includes a pair of second side rails extending the height thereof, each of said lastmentioned side rails having a first planar wall extending in the

principal face of said second frame member and of a width substantially equal to the distance between the juncture of said firstmentioned first and second walls and said projections, and a second planar wall extending perpendicular to said second frame member first wall and of a width substantially equal to the distance between said firstmentioned second and third walls;

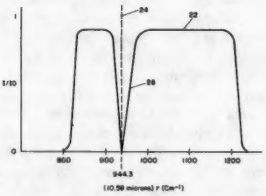
the arrangement being such that said second frame member side rail is insertable into said first frame member side rail and retained therein by engagement of said second side rail second walls between said aforementioned side rail second and third walls and abutting said frame member first wall and by engagement of said projections with the free lateral edge of said second side rail first wall.

4,884,855

NARROW-BAND OPTICAL ABSORPTION FILTER

James E. Moore, Wheaton, Ill.; B. Michael Kale, Ridgefield, Conn.; George Csanak, Los Alamos, N. Mex., and Fritz Luty, Salt Lake City, Utah, assignors to Barnes Engineering Company, Stamford, Conn.

Filed Jul. 12, 1983, Ser. No. 512,998
Int. Cl.[4] G02B *5/22*
U.S. Cl. 350—1.1 **45 Claims**



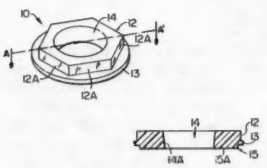
19. A narrow-band filter for absorbing radiation at a wavelength in the range of 10.5 to 10.8 microns and for transmitting radiation in a surrounding 8 to 12 micron band having a high transmission ratio, comprising an alkali-halide crystal having optical incidence and transmission surfaces and thiocyanate ion present as an impurity in the range of about 0.01 to 5 atomic percent.

4,884,856

POLYGONAL MIRROR AND METHOD OF MAKING SAME

Hatsuichi Takeyasu, Kawaguchi; Kenichi Sakata, Utsunomiya, and Fumitoshi Yura, Tochigi, all of Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Apr. 1, 1988, Ser. No. 177,351
Claims priority, application Japan, Apr. 3, 1987, 62-82607
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **17 Claims**



1. A polygonal mirror comprising:

a mirror body in the form of a regular prism having a central axis, said regular prism having a plurality of side faces formed respectively into reflecting faces wherein, during rotation of said mirror body about said central axis, said reflecting faces successively deflect an incident light ray to cause the deflected light ray to carry out scanning; and

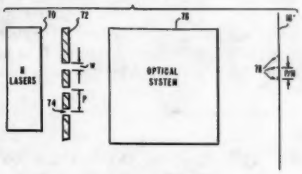
a flange unitarily formed on said mirror body, said flange having a size at least equal to a circle circumscribing said regular prism in a plane substantially perpendicular to said central axis.

4,884,857

SCANNER FOR USE IN MULTIPLE SPOT LASER ELECTROPHOTOGRAPHIC PRINTER

Ravinder Prakash, Ardsley, N.Y., and Larry L. Wolfe, Broomfield, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1987, Ser. No. 118,720
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **20 Claims**



1. An image scanning apparatus for use in a multiple spot laser electrophotographic printer for projecting an object image onto a photoconductor surface comprising:

a plurality of laser means each laser means transmitting a light beam responsive to an object image;

first optical system means including a first aperture plate containing a plurality of apertures disposed for causing each of the plurality of light beams to illuminate a respective one of said plurality of apertures;

a rotating polygon mirror means; and

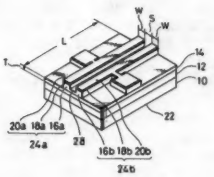
second optical system means including a second aperture plate containing an aperture disposed for receiving light beams passing through said first aperture plate, said second aperture plate being disposed at a conjugate plane with the photoconductor surface, said second optical system means being disposed for projecting said light beams onto said rotating polygon mirror means from which said object image onto said photoconductor surface.

4,884,858

DISTRIBUTED COUPLER SWITCH

Takashi Ushikubo; Hideaki Okayama; Masato Kawahara, and Issei Asabayashi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1988, Ser. No. 272,828
Claims priority, application Japan, Nov. 20, 1987, 62-293360
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.13 **13 Claims**



13. A distributed coupler switch comprising:

a substrate:

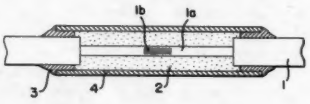
a lower cladding layer disposed on said substrate;
a light-guide layer disposed on said lower cladding layer; and
a pair of parallel stripe-geometry upper cladding layers disposed on said light-guide layer;
each of said layers being composed of compound semiconductor materials;
said switch further comprising first and second electrodes for applying an electric field to said light-guide layer and said pair of upper cladding layers, and a coupling enhancement region disposed on said light-guide layer and extending only between said upper cladding layers, said coupling enhancement region being made of the same material as said upper cladding layers but being lower than them in step height; whereby said coupling enhancement region causes the equivalent index of refraction in said light guide layer beneath said coupling enhancement region to be different than the equivalent index of refraction in said light-guide layer in regions which are disposed on either outward side of and which extend away from said upper cladding layers, whereby application of an electric field causes enhanced electric field coupling between said pair of parallel stripe-geometry upper cladding layers.

4,884,859

OPTICAL ATTENUATOR AND MANUFACTURING METHOD FOR MAKING SAME

Hiroyoshi Yamamoto; Toshiharu Takesue, and Naoki Kawawada, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Aug. 15, 1988, Ser. No. 232,442
Claims priority, application Japan, Aug. 21, 1987, 62-207517
Int. Cl.[4] G02B *6/26*; C03B *37/025*
U.S. Cl. 350—96.15 **14 Claims**



1. A method of manufacturing optical attenuators comprising the steps of:
heating a part of an optical fiber composed of a core and a cladding to a temperature around the softening point thereof; and applying an external force at a predetermined speed to said optical fiber for generating fine cracks around the cladding to induce radiation loss therefrom, thereby forming an optical attenuation area in the heated part of said optical fiber.

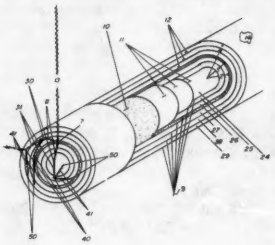
4,884,860

LINEAR LENS AND METHOD FOR CONCENTRATING RADIANT ENERGY AND MULTIPLYING PHOSPHOR LUMINANCE OUTPUT INTENSITY

David C. Brown, 4751 State Rt. 34, Winfield, W. Va. 25213

Continuation-in-part of Ser. No. 826,304, Feb. 5, 1986, Pat. No. 4,733,929, and Ser. No. 849,055, Apr. 4, 1986, Pat. No. 4,799,748. This application Mar. 2, 1988, Ser. No. 162,829
Int. Cl.[4] F24J *2/48*
U.S. Cl. 350—96.15 **43 Claims**

34. A device for concentrating radiant energy comprising,
a plurality of first optical waveguide elements, each of said first waveguide elements having a body portion extending between a pair of ends, a first external surface on said body portion exposed to receive incident radiation between the end of said body portion and a second external surface exposed to emit radiation at at least one of said ends of said body portion,
a corresponding plurality less one of thin-walled photoluminescent phosphor cylinders located colinearly and coaxially with said optical waveguide elements with individual ones of said photoluminescent phosphor cylinders being contained within individual ones of said optical waveguide elements,
a corresponding plurality of second optical waveguide elements with individual ones of said second optical waveguide elements being contained within said photoluminescent phosphor cylinders,



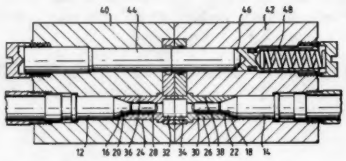
each said optical waveguide having means for internally changing the direction of travel of at least a portion of radiant energy emitted by said photoluminescent phosphor cylinders to each optical waveguide associated therewith to effect capture of a fraction of the radiant energy emitted by said phosphor cylinders in guided modes of said optical waveguides and by cumulative propagation of trapped radiation energy along said waveguide body portion to thereby effect a concentration of radiation energy and emission at at least one of said ends of said optical waveguide.

4,884,861

METHOD OF OPTICAL CONNECTION OF AN END PORTION OF AN OPTICAL FIBRE WITH AN OTHER OPTICAL ELEMENT

Ingvar Nodfelt, Löddeköpinge, Sweden, assignor to AB Stratos, Gnosjo, Sweden

Continuation of Ser. No. 875,465, Jun. 18, 1986, abandoned. This application Feb. 5, 1988, Ser. No. 154,507
Claims priority, application Sweden, Mar. 19, 1986, 8601277
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 **4 Claims**



1. A method of optically connecting an end portion of a first optical fibre with an other optical element, such as an end portion of a second optical fibre, in which the end portion of the first optical fibre is optically connected with a first lense that in turn is optically connected with said other optical element, such as the end portion of a second optical fibre through a second lense, comprising the steps of:
providing a connector element including a surface of revolution about an axis, the surface of revolution constituting a reference surface of the connector element;
fixedly placing the first lense in the connector element such that the optical axis of the first lense and the axis of the surface of revolution of the connector element coincide,

said step of fixedly placing the first lense in the connector element being performed by positioning the connector element, with the first lense placed therein, such that the optical axis of the first lense coincides with an axis of revolution of the connector element, and then forming the reference surface of the connector element while the connector element is rotated around the axis of revolution, said reference surface being formed by machining, preferably turning;

fixing the end portion of the first optical fibre in a sleeve-shaped element such that the end portion is centered in relation to a surface of revolution constituting a reference surface of the sleeve-shaped element; and

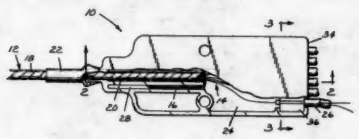
connecting the sleeve-shaped element with the connector element such that the reference surface of the sleeve-shaped element and the reference surface of the connector element are in engagement with each other in accordance with a single predetermined orientation, whereby the first lense and the end portion of the first optical fibre are optically centered in relation to each other without further adjustment.

4,884,862

FIBER OPTIC FAN-OUT MODULE

Mogens Kofod, Howell, N.J., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 17, 1988, Ser. No. 258,840
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **11 Claims**



1. A fiber optic fan-out module comprising:

a housing having first and second ends, said housing having a channel in said first end for receiving a fiber optic cable having a plurality of optical fibers and protective filaments contained within a retaining means, and a groove adjacent said channel for receiving said protective filaments from said cable and said housing further having an opening in said second end for allowing the individual optical fibers of said cable exit said housing; and

an anchor block in said opening in said second end, said anchor block having first and second edges and having a passage through said anchor block for allowing optical fibers in loose protective sleeves containing protective filaments to exit said housing, said anchor block having a groove in said first edge adjacent said passage for receiving said protective filaments from said sleeve.

4,884,863

OPTICAL FIBER SPLICING ENCLOSURE FOR INSTALLATION IN PEDESTALS

Rodney A. Throckmorton, Conover, N.C., assignor to Siecor Corporation, Hickory, N.C.

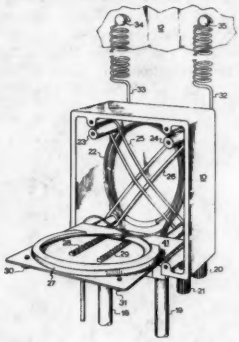
Filed Mar. 6, 1989, Ser. No. 319,483
Int. Cl.[4] G02B *6/40*
U.S. Cl. 350—96.20 **4 Claims**

1. Apparatus comprising:

(a) an object mounted to the earth;

(b) an optical waveguide splice enclosure; and

(c) elastic material mounted to the object, said elastic material holding the optical waveguide splice enclosure in an



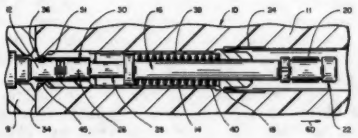
essentially stationary position during limited movement of the ground surface due to frost heave or the like.

4,884,864

PIN AND SOCKET FIBER OPTIC CONNECTOR

Roger H. Ellis, Atherton; A. Christian Walton, and Akira Tomita, both of Redwood City, all of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Continuation-in-part of Ser. No. 29,840, Mar. 24, 1987, abandoned, and a continuation-in-part of Ser. No. 99,941, Sep. 23, 1987, abandoned. This application Dec. 14, 1987, Ser. No. 132,493
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **16 Claims**



1. A fiber optic connector, comprising:

a connector body having at least one socket contact cavity therein;

a socket contact inserted into said contact cavity, said socket contact having a retention area at one end and a retractable contact portion; and

means for limiting axial movement of said contact portion so that when said contact portion is unretracted a tip of said contact portion is substantially flush with a front surface of the connector body so as to be within 3 mm thereof, said limiting means being constructed so as to align front ends of said retractable contact portion and a mating contact pin.

4,884,865

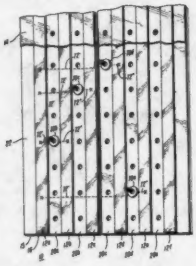
FIBER OPTIC LENS AND LAMP ASSEMBLY AND METHOD FOR INSTALLING SAME UNDER FLOOR COVERING AND THE LIKE

Frederick G. Grise, Osterville, Mass., assignor to Flexwatt Corporation, West Wareham, Mass.

Continuation-in-part of Ser. No. 912,783, Sep. 26, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 224,423

Int. Cl.[4] G02B *6/04*; F21V *7/04*

U.S. Cl. 350—96.24 19 Claims



1. A fiber optic lens assembly comprising:

a. a lens bundle of optical fibers, each fiber having a first end portion and a second end portion, adjoining ones of said second end portions being attached to each other and the fibers of said bundle being unattached at an intermediate axial portion; and

b. a housing for said lens and for a light source, said housing having an axis of rotational symmetry, a light source end and a fiber end and:

(i) means for receiving said light source comprising a capped annular portion having a minimum inside diameter capable of enclosing said light source, a capped and an open end, said open end coincident with said light source end of said housing;

(ii) means for securing said first ends of said fibers to said housing in an optically communicating relationship with said light source comprising a first annular portion at said fiber end of said housing, having a cylindrical radially inner surface, an open axial end and a closed axial end; and

(iii) a light-transmitting web portion having a lens surface and a light source surface, said surfaces each having an axis of rotation coincident with the axis of rotation of said housing, said lens surface being coincident with said closed axial end of said first annular portion and said light source surface being coincident with said capped end of said capped annular portion

wherein light may pass from said light source to said first ends of said fibers, through each fiber longitudinally along the length of each fiber, and to the attached ends of said fibers.

4,884,866

FLUORINE-CONTAINING RESIN COMPOSITION HAVING LOW REFRACTIVE INDEX

Yutaka Hashimoto; Masayuki Kamei, both of Sakai, and Toshihiko Umaba, Takaishi, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 18,398, Feb. 25, 1987, Pat. No. 4,786,658. This application Aug. 26, 1988, Ser. No. 236,736

Claims priority, application Japan, Feb. 27, 1986, 61-40383; Apr. 24, 1986, 61-93226

Int. Cl.[4] G02B *6/02*

U.S. Cl. 350—96.34 13 Claims

1. An optical fiber formed by the process comprising: coating an optical fiber core with an active energy ray-curable resin composition which gives a cured product having a refractive index of not more than 1.44, said composition comprising (I) a fluorine-containing polymer composed of (A) a fluorine-containing (meth)acrylate, and at least one of (B) an alpha,beta-ethylenically unsaturated dicarboxylic acid ester and (C) a non-fluorine-containing mono(meth)acrylate, and having a fluorine atom content of at least 30% by weight, (II) a fluorine-containing (meth)acrylate, (III) a non-fluorine-containing mono(meth)acrylate and (IV) a polyfunctional monomer containing at least two (meth)acryloyl groups in the molecule; and thereafter irradiating active energy rays onto the coating to cure it.

4,884,867

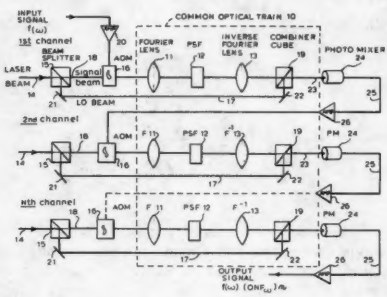
CASCADED OPTICAL NOTCHING SYSTEM

Robert W. Brandstetter, Levittown; Nils J. Fonneland, Lake Ronkonkoma, and Philip G. Grieve, New York, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 31, 1988, Ser. No. 200,569

Int. Cl.[4] C02B *27/42*; C06C *7/19*

U.S. Cl. 350—162.12 13 Claims



1. An optical filter system, comprising

a source of substantially coherent, collimated beams of optical radiation;

modulating means for modulating beams of said optical radiation with a radio frequency signal;

a plurality of optical filtering channels having a common pathway and including means for producing an optical Fourier transform, an optical filter, and means for producing an inverse optical Fourier transform;

one of single pass or recursive means for directing a beam of said modulated optical radiation through each of said respective optical filtering channels to traverse said optical filtering means for attenuating said optical radiation of unwanted spectral components;

conversion means including photo-mixer means for down-converting each beam of filtered optical radiation to provide a notched radio frequency signal; and

cascading means including a plurality of channels and additional photo-mixer means for cascading the notched radio frequency signals through said optical filtering channels to provide a notched radio frequency signal having a progressively greater notch depth with each successive channel by modulating each beam of optical radiation with the notched radio frequency signal of the next-preceding optical filtering channel.

4,884,868

OPTICAL COMPONENT FOR SEPARATING LIGHT INTO DIFFERENT WAVELENGTH COMPONENTS

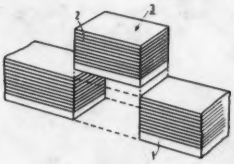
Heinz Böhm, Erlangen, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jan. 23, 1985, Ser. No. 694,188

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1984, 3402258

Int. Cl.[4] G02B *5/00*

U.S. Cl. 350—168 9 Claims



7. An optical device for separating a light beam into its component wavelengths, said device comprising:

a first substrate with a plurality of substantially planar glass layers stacked on the substrate, adjacent glass layers having different refractive indices, said stack of glass layers being provided with first and second optically active faces, said optically active faces intersecting the substrate; and

a second substrate with a plurality of substantially planar glass layers stacked on the substrate, adjacent glass layers having different refractive indices, said stack of glass layers being provided with third and fourth optically active faces, said optically active faces intersecting the substrate;

characterized in that the second optically active face is optically coupled to the third optically active face.

4,884,869

FLY'S EYE LENS UNIT FOR ILLUMINATION SYSTEM

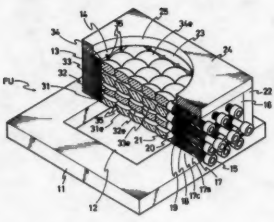
Haruo Uemura, Kyoto, Japan, assignor to Dainippon Screen Mfg., Co., Ltd., Kyoto, Japan

Filed Nov. 12, 1987, Ser. No. 119,715

Claims priority, application Japan, Nov. 11, 1986, 61-172952[U]

Int. Cl.[4] G02B *27/00*

U.S. Cl. 350—169 16 Claims



16. A fly's eye lens structure for assembling element lenses into a single unit, comprising:

a first frame defining an incident aperture of the fly's eye lens;

a second frame defining an exit aperture of the fly's eye lens;

a plurality of element lenses orderly aligned in twodimensions, said element lenses forming a plurality of rows extending in a predetermined direction and being closely in contact with each other;

side walls disposed between first and second frames for housing said element lenses therein; and

biasing means for applying a biasing force to the element lenses in the direction of said rows of the element lenses.

4,884,870

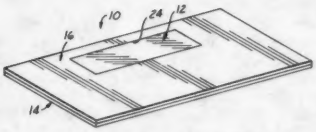
LENS STRUCTURE FOR A VEHICLE RADIO OR THE LIKE

Frank H. Klein; Steven F. Selby, and Sigmund Klueger, all of Huntsville, Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 17, 1988, Ser. No. 258,758

Int. Cl.[4] G02B *7/02*

U.S. Cl. 350—319 4 Claims



1. A lens structure for a vehicle radio or the like to permit display of information generated by the radio, the lens structure comprising: a forward panel, said forward panel being injection molded of a clear thermoplastic resin and including a forward surface and a rearward surface; a lens portion of said rearward surface projecting rearwardly therefrom, the lens portion forming, with a contiguous forward portion of the forward panel, a lens; and a rearward panel, said rearward panel being injection molded of an opaque thermoplastic resin onto the forward panel and heat fused to the portion of the rearward surface of the forward panel adjacent to, but not including, a rearward surface of said lens.

4,884,871

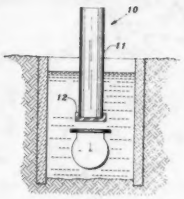
METER READING AID

Charles M. Creech, Jr., 5833 Creola Rd., Charlotte, N.C. 28226

Filed Aug. 15, 1988, Ser. No. 231,997

Int. Cl.[4] G02B *5/00*

U.S. Cl. 350—319 6 Claims



1. A device for reading submerged meters comprising:

viewing tube means defining an open cylindrical volume for permitting viewing of a submerged meter through air in said volume, and

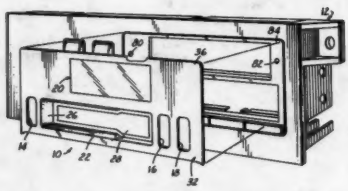
transparent, flexible closure means closing one end of said tube means for engaging a face of said submerged meter and conforming to the surface of said face upon imposition on said tube means of a force directed longitudinally thereof for thereby expelling water from between said face and said closure means.

4,884,872

LENS STRUCTURE FOR A COMBINED RADIO/AUDIO TAPE CASSETTE PLAYER OR THE LIKE

Frank H. Klein; Steven F. Selby, and Sigmund Klueger, all of Huntsville, Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 27, 1988, Ser. No. 263,315
Int. Cl.[4] G02B *27/00*
U.S. Cl. 350—321 5 Claims



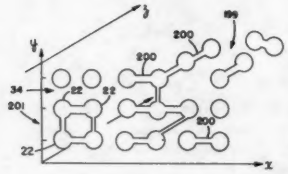
1. A lens structure for a combined vehicle radio/audio tape cassette player or the like to permit display of information generated by the combined vehicle radio/audio tape cassette player, the lens structure comprising: a forward panel, said forward panel being injection molded of a clear thermoplastic resin and having an opening therein for insertion of an audio tape cassette; a wall structure surrounding the opening and projecting rearwardly therefrom to define a chute for guiding an audio tape cassette upon insertion thereof into an audio tape player, the forward panel, including said wall structure, having a forward surface and a rearward surface, a lens portion on said rearward surface projecting rearwardly therefrom, the lens portion forming, with a contiguous forward portion of the forward panel, a lens; and a rearward panel, said rearward panel being injection molded of an opaque thermoplastic resin onto the forward panel and heat fused to the portion of the rearward surface of the forward panel adjacent to, but not including, a rearward surface of said lens.

4,884,873

ENCAPSULATED LIQUID CRYSTAL MATERIAL, APPARATUS AND METHOD HAVING INTERCONNECTED CAPSULES

James L. Fergason, Atherton, Calif., assignor to Manchester R & D Partnership, Pepper Pike, Ohio

Division of Ser. No. 585,883, Mar. 2, 1984, Pat. No. 4,707,080, which is a continuation-in-part of Ser. No. 302,780, Sep. 16, 1981, Pat. No. 4,435,047, which is a continuation-in-part of Ser. No. 477,138, Mar. 21, 1983, Pat. No. 4,606,611, which is a continuation-in-part of Ser. No. 477,242, Mar. 21, 1983, Pat. No. 4,616,903. This application Oct. 27, 1987, Ser. No. 114,073
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—334 42 Claims



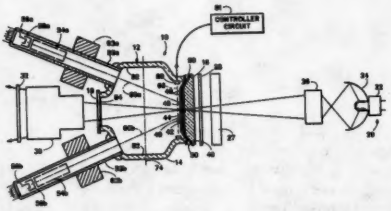
1. Liquid crystal apparatus, comprising liquid crystal material, containment means for inducing a generally non-parallel alignment of said liquid crystal material which in response to such alignment at least one of scatters and absorbs light and which in response to a prescribed input reduces the amount of such scattering or absorption, and reflector means for reflecting light scattered by or transmitted through said liquid crystal material.

4,884,874

METHOD OF ADDRESSING DISPLAY REGIONS IN AN ELECTRON BEAM-ADDRESSED LIQUID CRYSTAL LIGHT VALVE

Thomas S. Buzak, Beaverton, and Rolf S. Vatne, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 46,822, May 5, 1987, Pat. No. 4,765,717.
This application Jul. 14, 1988, Ser. No. 219,510
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—336 17 Claims



1. In an electron beam-addressed liquid crystal light modulator having writing and erasing means for emitting a writing beam of primary electrons and an erasing beam of primary electrons that strike a target surface of a liquid crystal cell to cause the emission of secondary electrons from the target surface, a method of sequentially addressing and erasing selected regions on the target surface with the respective writing and erasing beams, comprising:

scanning the writing beam across the target surface to successively address selected regions thereof; and

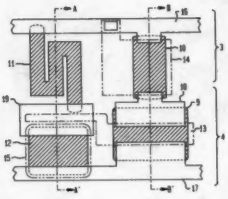
scanning the erasing beam across the target surface to successively erase the selected regions.

4,884,875

LIQUID CRYSTAL LIGHT VALVE SHOWING AN IMPROVED DISPLAY CONTRAST

Fujio Okumura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 254,022
Claims priority, application Japan, Oct. 6, 1987, 62-252783
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—342 5 Claims



1. A liquid crystal light valve comprising: a first transparent insulating substrate provided with a plurality of light switching elements respectively connected to pixel electrodes, a second transparent insulating substrate provided with transparent electrodes, and a liquid crystal sandwiched between the first substrate and the second substrate, each of said light switching elements including a voltage divider circuit and an inverter

circuit respectively connected between a high voltage terminal and a low voltage terminal, said voltage divider circuit comprising a photoconductor and a resistor element serially connected, an input terminal of said inverter circuit being connected to a node connecting said photoconductor and resistor element, and an output terminal of said inverter circuit being connected to said pixel electrodes.

4,884,876

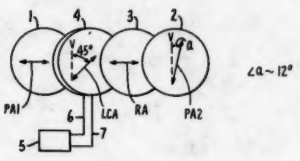
ACHROMATIC LIQUID CRYSTAL SHUTTER FOR STEREOSCOPIC AND OTHER APPLICATIONS

Lenny Lipton, Greenbrae; Arthur Berman, San Jose, and Lawrence D. Meyer, Mill Valley, all of Calif., assignors to Stereographics Corporation, San Rafael, Calif.

Continuation of Ser. No. 116,242, Oct. 30, 1983, abandoned. This application Nov. 2, 1988, Ser. No. 267,699

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—347 E **33 Claims**



1. An achromatic liquid crystal shutter system, including:

(a) a first polarizer, having an absorption axis oriented in a first direction;

(b) a first surface mode liquid crystal cell, having a rub axis oriented in a second direction; and

(c) a first analyzer, having a slow axis oriented in a third direction; wherein the first, second, and third directions are selected so that the system is capable of being driven so as to have optimal dynamic range.

4,884,877

LIQUID CRYSTAL TEMPERATURE SENSOR AND MATERIALS UTILIZING MICROENCAPSULATED LIQUID CRYSTAL

James L. Fergason, Atherton, Calif., assignor to Manchester R & D Partnership, Pepper Pike, Ohio

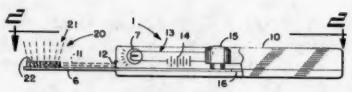
PCT No. PCT/US85/00953, § 371 Date Jan. 22, 1986, § 102(e) Date Jan. 22, 1986, PCT Pub. No. WO85/05467, PCT Pub. Date Dec. 5, 1985

Continuation-in-part of Ser. No. 612,906, May 22, 1984, abandoned. This PCT application May 21, 1985, Ser. No. 829,652

The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—351 **31 Claims**



1. A temperature sensor and indicator, comprising

liquid crystal means for scattering or transmitting light incident thereon as a function of temperature of said liquid crystal means,

containment means for containing plural volumes of said liquid crystal means, said containment means comprising means for distorting the natural structure of said liquid crystal means to distorted, curvilinearly aligned structure, and

support means for supporting said volumes of liquid crystal means in said containment means for sensing temperature,

said liquid crystal means having a mesomorphic or anisotropic phase at temperatures below a transition temperature and an isotropic phase at temperatures at and above such transition temperature.

4,884,878

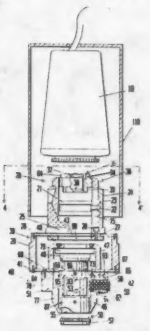
ZOOM OPTICAL UNIT

Mark G. Arenal, Laguna Nigel, and Robert A. Murphy, Lakewood, both of Calif., assignors to Ram Optical Instrumentation, Inc., Huntington Beach, Calif.

Filed Nov. 17, 1986, Ser. No. 931,264

Int. Cl.[4] G02B *15/00*

U.S. Cl. 350—429 **22 Claims**



1. An optical unit for use with an optics receiving and processing unit which comprises:

a. a zoom lens housing;

b. a zoom lens with its upper end fixedly secured within said zoom lens housing and having a rotatable barrel for adjustment of its magnification power;

c. a zoom lens pulley surrounding said rotatable barrel of said zoom lens and fixedly secured thereto;

d. a thumb wheel carried on a stub shaft rotatably mounted at a lateral location of said rotatable barrel within said zoom lens housing and beside said zoom lens pulley; and

e. elastic belt means rotatably linking said stub shaft and said zoom lens pulley;

whereby the magnification power of said zoom lens may be varied by movement of said thumb wheel without dislocating the position of said zoom lens in said assembly.

4,884,879

LENS SYSTEM FOR PROJECTION TELEVISION RECEIVERS

Kyohei Fukuda, Fujisawa; Soichi Sakurai; Koji Hirata, both of Yokohama, and Shigeru Mori, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 24, 1986, Ser. No. 911,070

Claims priority, application Japan, Sep. 25, 1985, 60-210231; Jan. 29, 1986, 61-15937

Int. Cl.[4] G02B *13/18, 9/34*

U.S. Cl. 350—432 **24 Claims**

1. An optical system of a projection television receiver for projecting pictures from a picture tube onto a screen, comprising a tube face of the picture tube curved in such a direction as to compensate the curve of the image face of the projected picture on the screen, and further comprising lenses arranged

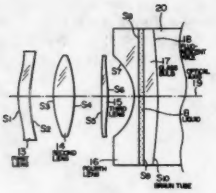
from the screen side to the tube face of the receiver tube in the order of:

(A) a first lens having power (reciprocal of focal distance) P_1 related to power P_0 of the whole optical system as

$$0.05<P_1/P_0<0.25$$

(B) a second glass lens of biconvex form having power P_2 related to said P_0 as

$$0.85<P_2/P_0<0.95$$



(C) a third lens having power P_3 related to said P_0 as

$$0.2<P_3/P_0<0.45;\ \text{and}$$

(D) a fourth lens comprising a concave lens disposed to compensate the curve of the image face of the projected picture on the screen;

wherein said third lens is spaced from said second glass lens by a distance larger than a thickness of said third lens.

4,884,880

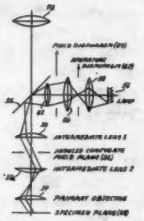
KIT FOR CONVERTING A STANDARD MICROSCOPE INTO A SINGLE APERTURE CONFOCAL SCANNING EPI-ILLUMINATION MICROSCOPE

Jeffrey W. Lichtman, and William J. Sunderland, both of St. Louis, Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 120,641, Nov. 16, 1987, which is a continuation-in-part of Ser. No. 100,468, Sep. 24, 1987, abandoned. This application Sep. 14, 1988, Ser. No. 243,353

Int. Cl.[4] G02B *21/00, 21/06, 26/02*

U.S. Cl. 350—507 **23 Claims**



1. A kit for converting a standard microscope for viewing a specimen into a confocal scanning microscope, the standard microscope including a light source for producing incident light for illuminating the specimen, a beam splitter means for separating incident light from light returning from the specimen, and an objective lens for focusing the light at a plane whereat the specimen is positioned (specimen plane), the kit comprising optic means to create a field plane in the incident light path, a means to re-position the objective lens to create a field plane in the returning light path, said field planes being conjugate to the specimen plane, an aperture means, the aperture means being positioned at the conjugate field planes, and means to controllably scan the aperture means within the conjugate field plane.

4,884,881

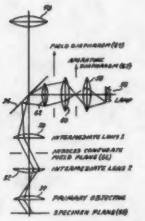
SINGLE APERTURE CONFOCAL SCANNING EPI-ILLUMINATION MICROSCOPE

Jeffrey W. Lichtman, and William J. Sunderland, St. Louis, both of Mo., assignors to Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 120,641, Nov. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 100,468, Sep. 24, 1987, abandoned. This application Sep. 14, 1988, Ser. No. 243,354

Int. Cl.[4] G02B *21/00, 21/06, 26/02*

U.S. Cl. 350—507 **34 Claims**



1. A confocal scanning microscope for viewing a specimen with epi-illumination, the microscope including a light source for creating incident light to illuminate the specimen, first optic means for focusing the incident light to form a specimen plane, means to separate incident light from light returning from the specimen, the specimen plane being adapted for receiving the specimen desire be viewed, an aperture means, a second optic means to create a field plane conjugate to the specimen plane for incident light, said second optic means being positioned between the light separating means and the aperture means, said first optic means having means to create a field plane conjugate to the specimen plane for light returning from the specimen, said first optic means being positioned between the aperture means and the specimen, said conjugate field planes being coincident with the aperture means being positioned thereat, and means to create a conjugate field plane for returning light whereat the specimen may be viewed.

4,884,882

APPARATUS FOR POSITIONING OPTICAL ELEMENTS

Benjamin Schnarch, Bat Yam, Israel, assignor to Israel Aircraft Industries Ltd., Lod, Israel

Filed Jul. 15, 1988, Ser. No. 219,405

Claims priority, application Israel, Jul. 16, 1987, 83219

Int. Cl.[4] G02B *5/08*

U.S. Cl. 350—634 **18 Claims**

1. Apparatus for precise rapid orientation of an optical element comprising:

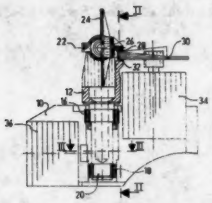
means for supporting an optical element for rotation about a first axis; and

means for selectably positioning the optical element about the first axis and including:

a rotatable cam having a cam surface, a dimension of which varies along its extent and determines the position of the optical element about the first axis, said rotatable cam comprising a generally circular ring of varying width;

a motor for determining the rotational orientation of the rotatable cam and thus determining which portion

thereof is in operative engagement with the optical element for positioning thereof; and



means for interconnecting the rotatable cam with the motor.

4,884,883

SPECTACLE FRAME HAVING REMOVABLE DECORATIVE ELEMENTS

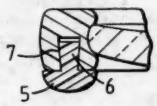
Norman W. Chappell, 95 Hainault Road, Chigwell, Essex, Great Britain

Filed Jun. 10, 1988, Ser. No. 205,350

Claims priority, application United Kingdom, Feb. 27, 1987, 8704656

Int. Cl.[4] G02C *11/02*

U.S. Cl. 351—52 3 Claims



1. A spectacle frame having a removable decorative part located by a groove formed in the spectacle frame which groove tapers outwardly from the surface of the frame in transverse cross-section, and being characterised in that the decorative part includes: a projection having a dovetailed cross-section complementary to that of the groove and arranged to engage in the groovc; and a further portion which is of greater length and width than the groove opening and is bowed so as to be deformed flat on fitting the decorative part to the frame by engagement of the projection in the groove.

4,884,884

APPARATUS FOR TREATMENT OF THE EYE WITH THE USE OF A LASER

Werner Reis, Munich, Fed. Rep. of Germany, assignor to G. Rodenstock Instrumente GmbH, Munich, Fed. Rep. of Germany

PCT No. PCT/DE87/00279, § 371 Date Feb. 18, 1988, § 102(e) Date Feb. 18, 1988, PCT Pub. No. WO87/07829, PCT Pub. Date Dec. 30, 1987

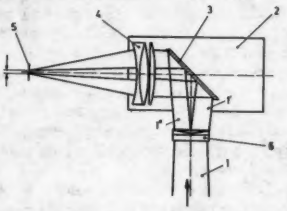
PCT Filed Jun. 20, 1987, Ser. No. 162,322

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1986, 3620744

Int. Cl.[4] A61B *3/10*

U.S. Cl. 351—221 8 Claims

1. An apparatus for treatment of an eye with a laser comprising imaging means for focusing a laser beam onto an area of the eye to be treated, and at least one beam multiplier positioned in the path of the laser beam for treatment of the eye, the at least one beam multiplier splitting the laser beam into at least two sub-beams having a predetermined spacial relationship to one another, the imaging means focusing the at least two sub-beams



as at least two individual mutually spaced laser beam spots on the area of the eye to be treated.

4,884,885

MICROFILM APERTURE CARD, IN PARTICULAR CAMERA CARD

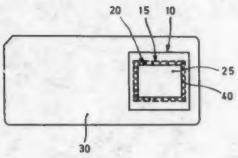
Dieter K. J. Schweinsberg, Lautertal, Fed. Rep. of Germany, assignor to Datox Organisation D. Schweinsberg GmbH & Co. KG, Rodental, Fed. Rep. of Germany

Filed Oct. 27, 1987, Ser. No. 113,558

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642954

Int. Cl.[4] G03B *31/00*

U.S. Cl. 353—120 18 Claims



1. A microfilm aperture card, in particular a camera card, comprising a cardboard, an aperture cut-out in the cardboard to provide a window, an adhesive tape extending around the periphery of said window, said tape having an outer peripheral portion secured to one side of said cardboard around the periphery of said window, said tape having an inner peripheral portion defining an adhesive exposed inner window for the reception of a microfilm, whereby said outer peripheral portion of said tape defines a frame about said window and said inner portion of said tape defines a frame on the inside of the periphery of said window, said tape being opaque to provide an opaque border about said microfilm and said tape itself carries information.

4,884,886

BIOLOGICAL PARTICLE IDENTIFICATION APPARATUS

Gary C. Salzman; Charles T. Gregg; W. Kevin Grace, and Richard D. Hiebert, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Continuation of Ser. No. 180,686, Apr. 8, 1988, abandoned, which is a continuation of Ser. No. 893,074, Aug. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 699,890, Feb. 8, 1985, abandoned. This application Jan. 26, 1989, Ser. No. 302,036

Int. Cl.[4] G01J *4/00*

U.S. Cl. 356—367 16 Claims

1. An apparatus for the identification of biological particles in static fluid suspension which comprises in combination:

a. means for generating collimated, high intensity, substantially monochromatic radiation having a chosen wavelength;

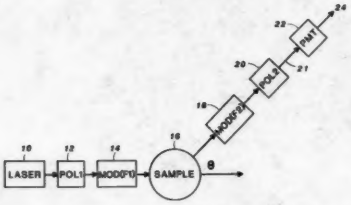
b. a first polarizer for receiving and substantially linearly polarizing the substantially monochromatic radiation, the resulting polarized radiation being emitted from said first polarizer having a polarization directed along a first axis;

c. at most a single first modulator having a first retardance of between ¼-wavelength and ¼-wavelength of said emitted polarized radiation for receiving said linearly polarized radiation and for generating polarization modulated elliptically polarized radiation therefrom, the modulation having a first frequency;

d. means for receiving the particle sample to be identified, for permitting the modulated elliptically polarized radiation to enter and interact with the biological particles, and for permitting the radiation scattered thereby to emerge;

e. at most a single second modulator having a second retardance of between ¼-wavelength and ¼-wavelength of the emitted polarized radiation for receiving a portion of the emerging scattered radiation at a chosen angle and for generating polarization modulated radiation therefrom having a second modulation frequency simultaneously impressed thereon;

f. a second polarizer for receiving the scattered radiation bearing two polarization modulation frequencies and interacting therewith to pass a component of the scattered



radiation having its polarization directed along a second axis, the first retardance and the second retardance, and the first axis and the second axis being chosen such that the dc component of the intensity of the scattered radiation is independent of polarization in order that a normalization of the scattered radiation can be achieved;

g. means for quantitatively detecting the radiation passed by said second polarizer, said quantitative detection means having sensitivity to each individual frequency of a plurality of frequencies present in the radiation passed by said second polarizer, the individual frequencies resulting from the effect of said first polarization modulator and said second polarization modulator on the emitted polarized radiation and the scattered radiation, respectively; and

h. means for identifying and measuring the intensity associated with each individual frequency of the plurality of frequencies present in the quantitatively detected radiation passed by said second polarizer, each of the intensities thereby identified and measured having a definite mathematical relationship substantially to a particular Mueller matrix element, the Mueller matrix elements deriving from the interaction of the biological particles with the polarization modulated elliptically polarized radiation; whereby eight matrix elements can be extracted, the matrix elements, when normalized by the intensity of the scattered radiation, containing information according to the nature of the biological particles under investigation.

4,884,887

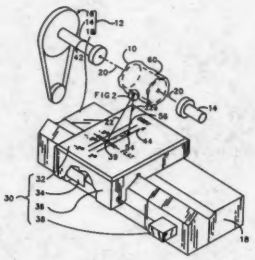
METHOD FOR POSITIONING A CRYSTAL INGOT

David A. Vanderwater, Santa Clara, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 23, 1987, Ser. No. 6,396

Int. Cl.[4] G01N *21/00*

U.S. Cl. 356—31 11 Claims



1. A method for positioning an ingot of crystalline material with respect to a device for processing the ingot in reference to a preselected processing reference direction of the device so that a crystallographic axis of the ingot has a desired spatial relationship to the preselected processing reference direction, comprising the steps of:

directing an incident light beam onto a spot on the ingot and causing reflection of a light beam;

detecting the reflected beam on a surface;

rotating the ingot about an axis of rotation;

detecting a line of travel of the reflected beam onto the surface as the ingot is rotated;

comparing the line of travel to a limit line on the surface, the limit line having a known relationship to the processing reference direction; and

re-positioning the ingot such that the crystallographic axis has the desired relationship to the processing reference direction in order to allow processing of the ingot along the processing reference direction by means of the device without requiring any further positioning step.

4,884,888

METHOD AND DEVICE FOR CONTACTLESS OPTICAL MEASUREMENT OF DISTANCE CHANGES

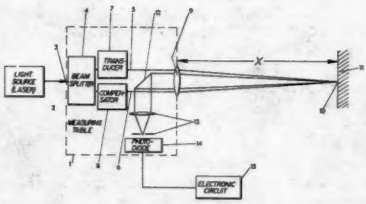
Karl-Aloys Bütefisch, Bovenden, Fed. Rep. of Germany, assignor to Deutsche-Forschungs- und Versuchsanstalt, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 860,548

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517044

Int. Cl.[4] G01B *11/14*

U.S. Cl. 356—373 10 Claims



1. A method of contactless optical measurement of distance

changes between the surface of an object and a known point comprising the steps of:

(a) producing at least two light beams;

(b) simultaneously directing the light beams toward a known point of intersection on the surface of an object with the object surface at least partially scattering the combined light of the intersecting superimposed beams;

(c) detecting the occurrence of combined scattered light from the object surface; and

(d) in the event of a distance change between the point of intersection and the object surface, adjusting the relative distance between the object surface and the point of intersection until combined scattered light is again detected so that the magnitude of the adjustment corresponds to the distance change; and

(e) detecting the magnitude of the adjustment.

4,884,889

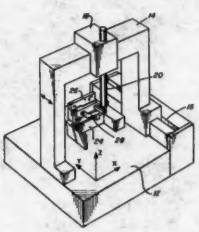
CALIBRATION SYSTEM FOR COORDINATE MEASURING MACHINE

Walter L. Beckwith, Jr., Warwick, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.

Filed Nov. 19, 1987, Ser. No. 122,771

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—375 **29 Claims**



1. Apparatus for measuring position errors in a machine having a first element and a table which are movable in at least two dimensions relative to each other, said apparatus comprising:

a reflector assembly attachable to said first element;

a laser measuring assembly attachable to said table for directing at least one outgoing laser beam in a selected measurement direction and for sensing said at least one laser beam reflected from said reflector assembly and generating position error signals representing position errors of said first element; and

means for mounting said laser measuring assembly to said table in different orientations and for mounting said reflector assembly to said first element in different orientations, said reflector assembly and said measuring assembly being aligned in each of said different orientations so that said at least one outgoing laser beam is reflected said reflector assembly back to said laser measuring assembly.

4,884,890

METHOD FOR NORMALIZING THE DETECTION SIGNALS OF MAGNIFIED IMAGES OF FLUORESCING MATERIALS

Vincent J. Contes, Palo Alto, Calif., assignor to Nanometrics Incorporated, Sunnyvale, Calif.

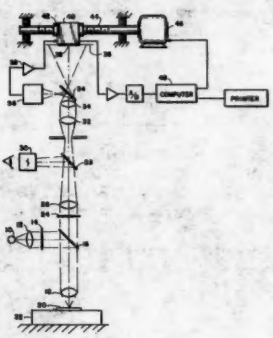
Filed Feb. 25, 1988, Ser. No. 160,330

Int. Cl.[4] G01B *11/02*

U.S. Cl. 356—384 **9 Claims**

1. In combination with an optical system for focusing a beam of radiation containing magnified images of an illuminated fluorescing material on a plane having means for scanning across said beam and containing a photosensor, a method for normalizing the detection by said photosensor against errors caused by intensity variations in the fluorescence of said material said method comprising the steps of:

measuring the intensity of the entire beam of radiation during the scanning of said beam; and



applying an electrical signal representing the instantaneous measured intensity of said entire beam of ratiation as feedback to adjust the gain of the photosensor.

4,884,891

FIBRE-OPTIC APPARATUS

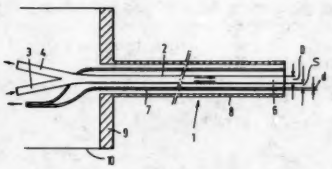
Petrus C. F. Borsboom, Westeremden, Netherlands, assignor to Sensoptic Development B.V., Westeremden, Netherlands

Filed Jul. 23, 1986, Ser. No. 888,294

Claims priority, application Netherlands, Jul. 26, 1985, 8502138

Int. Cl.[4] G01N *21/47*

U.S. Cl. 356—446 **4 Claims**



1. A fibre-optic apparatus for determining in a material to be examined a phenomenon affected by light back-scattered by surface and/or volume reflection, the material being described by a scattering coefficient and the apparatus comprising a light source; illuminating means connecting the light source to a sensor head; light detection means connected to the sensor head; and within said sensor head an optical illuminating fibre connected to said illuminating means, and a juxtaposed optical detection fibre connected to the light detection means; said optical fibres being mounted in a mutually fixed position, characterized in that, in said sensor head (1), at least one solid optical illuminating fibre (2) and at least one juxtaposed optical detection fibre (7) are disposed with their optical axes parallel to each other through an axial length from the end of the optical fibres arranged to face the material to be examined, said optical illuminating fibre (2) being adapted to be also used as an optical detection fibre in addition to the optical detection fibre (7), said optical illuminating fibre (2) having a diameter D and being connected to a first light detection means comprising means for measuring light back-scattering from the material (21) being examined and entering within an angle of accep-

tance of the optical illuminating fibre (2), said at least one juxtaposed optical detection fibre (7) having a diameter d, with $D \geq d$, being spaced apart a radial distance S measured between the walls of the optical illuminating fibre (2) and the at least one juxtaposed optical detection fibre (7), and said at least one juxtaposed optical detection fibre (7) being connected to a second light detection means comprising means for measuring light back-scattering from the material (21) being examined and entering at the radial distance S from the wall of the optical illuminating fibre within an angle of acceptance of the at least one juxtaposed optical detection fibre (7), with d being about 1/5 of the radial distance S.

4,884,892

METHOD AND APPARATUS TO GENERATE PRECISELY-DEFINED WALL SHEARING STRESSES

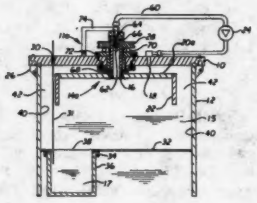
Giselher R. Gust, St. Petersburg, Fla., assignor to Hydro Data, Inc., St. Petersburg, Fla.

Filed May 16, 1988, Ser. No. 194,396

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717969

Int. Cl.[4] B01F *7/26*

U.S. Cl. 366—136 **12 Claims**



1. Apparatus for the generation of wall shearing stress fields of exact magnitude at a substrate/fluid interface comprising,

a housing sealed on top by a lid and having side walls,

a stirrer device attached to the lid such that its axis is aligned with the housing side wall and whose outer diameter is smaller than the inner diameter of the housing,

a hollow stem positioned centrally in the lid which is free to rotate but is sealed and drives the stirrer device, through which fluid is removed from a space confined by the housing,

a first pump to remove the fluid through the hollow stem, and

a return opening to the confined space to receive replacement fluid to maintain fluid volume.

4,884,893

METHOD AND APPARATUS FOR GENERATING AND DISPERSING IMMISCIBLE LIQUID PARTICLES IN A CARRIER LIQUID AND DISPENSING SAID CARRIER LIQUID

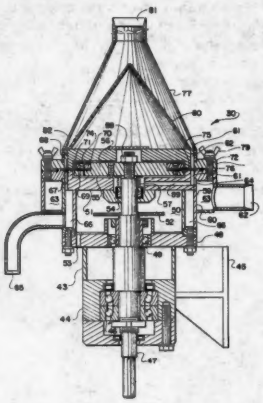
Dieter F. Zeiffer, Iron Station, N.C., and George M. Junkins, Dalton, Ga., assignors to Gaston County Dyeing Machine Co., Stanley, N.C.

Filed Jul. 10, 1987, Ser. No. 71,783

Int. Cl.[4] B01F *5/06*

U.S. Cl. 366—176 **26 Claims**

1. An apparatus for generating and dispersing liquid particles in a carrier liquid and dispensing said carrier liquid, said apparatus comprising means for providing a supply of a carrier liquid, means for providing a supply of another liquid that is at least temporarily immiscible in said carrier liquid, a housing adapted to receive liquid from said supplies, said housing having a passage for flow of carrier liquid in a flow path therethrough, said housing having an opening for introducing a stream of said another liquid into said flow path in said passage, shearing means mounted in said housing and extending into said flow path in said passage at said stream for shearing said stream into discrete particles to form a dispersion of said particles in said carrier liquid, a plurality of dispensing conduits, means for distributing said particle containing carrier liquid to said conduits for dispensing from said conduits onto a substrate, said opening being disposed for introducing said stream in a path substantially parallel to said flow path, said shearing means shearing said stream substantially transverse to said flow path, said passage being substantially tubular to form a substantially tubular flow path and a plurality of said openings being disposed for introducing a plurality of said streams, said housing having an annular chamber for receiving said carrier liquid and having a plurality of holes communicating between said chamber and said passage for introducing said carrier liquid into said passage, said housing having another annular chamber for receiving said another liquid, and said openings being disposed to introduce said another liquid from said another chamber into said passage.



4,884,894

FLUID MIXING ELEMENT

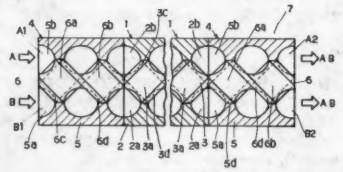
Nobuo Hashimoto; Hideo Ishii; Kenji Tanahashi; Kenji Ohno, and Kiichi Ohno, all of Tokyo, Japan, assignors to Yuugenkaisha Ohnobankinkougyousho, Tokyo, Japan

Continuation of Ser. No. 890,914, Jul. 28, 1986, abandoned. This application Feb. 14, 1989, Ser. No. 311,369

Claims priority, application Japan, Aug. 14, 1985, 60-177656

Int. Cl.[4] B01F *5/00*

U.S. Cl. 366—338 **13 Claims**



1. A fluid mixing element comprising at least two segmen arranged in fluid communication each segment comprising, cylindrical passage tube provided with at least one helic groove, having a semicircular cross-section, on an inner p ripheral wall of said passage tube throughout its length, and helical shaft provided with at least one helical groove, havi

a semicircular cross-section, or an outer peripheral wall of said helical shaft throughout its length, said cylindrical passage tube having said helical shaft inserted therein, wherein in each segment the helical grooves of the passage tube and the helical shaft are formed in opposite directions, and wherein segments in communication with each other have helical grooves of the passage tube and helical grooves of the helical shaft respectively formed in opposite directions.

4,884,895

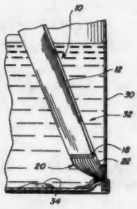
PAINT STIRRER

Leroy Rodgers, 665 E. Jarvis, Des Plaines, Ill. 60018

Filed Feb. 24, 1988, Ser. No. 159,749

Int. Cl.[4] B01F *13/00*

U.S. Cl. 366—343 **1 Claim**



1. An improved paint stirrer adapted for stirring paints which include pigments normally held in colloidal suspension, but which pigments settle out of colloidal suspension with time, the improvement comprising in combination,

an elongate body portion having an upper end and a lower end,

said upper end provided with a hand grip section integral with said elongate body portion,

said lower end of said elongate body portion provided with flexible stirring means fixedly secured thereto,

said flexible stirring means formed by a plurality of flexible and pliable members thereby to contact the paint pigments which have settled out of colloidal suspension to replace the pigments into colloidal suspension incident to the stirring process,

said flexible and pliable members consisting of a plurality of brush bristles fixedly secured at said lower end of said elongate body portion and in spaced apart relationship to permit the pigments to pass between the bristles,

said brush bristles having a proportionate length relative to said elongate body portion which does not exceed a ratio of approximately 1:12, and said brush bristles having an overall length which does not exceed one-half inch.

4,884,896

PRODUCTION LINE EMISSIVITY MEASUREMENT SYSTEM

Thomas G. Conway, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 13, 1989, Ser. No. 296,569

Int. Cl.[4] G01J *5/10;* **G01N** *25/00*

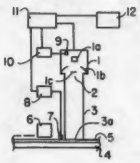
U.S. Cl. 374—9 **12 Claims**

1. An apparatus for determining the electromagnetic radiation emissivity in the infrared wavelength range of camouflage material comprising

a radiometer capable of generating a first signal in response to radiant energy output from said camouflage material, having an infrared detector and radiometer aperture for receiving the radiant energy output from said material, said signal being a measure of an apparent temperature of the material,

a tube having an inside diameter equal to that of the radiometer aperture, said tube being connected at its upper end to the radiometer in such manner that the detector aperture is enclosed in the tube and faces downwardly into the tube, said tube furthermore having an inside surface of high reflectivity, a lower opening of said tube being placed immediately above the camouflage material,

means for measuring the actual temperature of the material, and said material being above ambient temperature imme-



diately adjacent to said lower opening, and providing a second signal corresponding to said temperature,

means for measuring the temperature of the infrared detector, providing a third signal corresponding to said temperature, said means being located adjacent to the infrared detector, and

means for converting said first, second and third signals into temperature indications.

4,884,897

METHOD AND DEVICE FOR DETECTING THE TEMPERATURE TO WHICH A SOLID, A LIQUID OR A GAS MAY HAVE BEEN SUBJECTED

Joseph Toupin, Sable sur Sarthe, and Xavier Douesnel, 10-16, rue Pierre Guérin, 75016 Paris, both of France, assignors to Xavier Douesnel, Paris, France

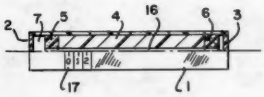
PCT No. PCT/FR87/00162, § 371 Date Mar. 21, 1988, § 102(e) Date Mar. 21, 1988, PCT Pub. No. WO87/07373, PCT Pub. Date Dec. 3, 1987

PCT Filed May 19, 1987, Ser. No. 162,314

Claims priority, application France, May 20, 1986, 8607590

Int. Cl.[4] G01K *11/06*

U.S. Cl. 374—160 **11 Claims**



1. A device for detecting a rise in the temperature of an object or material comprising:

a tube that is at least partially transparent;

a movable piece mounted for movement within the tube;

means for indicating the position of the movable piece with respect to the tube;

a meltable material disposed within the tube and comprising means for immobilizing the movable piece in an initial position; and

magnetic means for selectively subjecting the movable piece to a first force urging the movable piece toward the initial position and a second force urging the movable piece toward a final position, the movable piece being so mounted that melting of the meltable material permits the movable piece to respond to the magnetic means and move toward the final position, the magnetic means comprising at least:

a first magnetic element;

removable mounting means for removably mounting the first magnetic element on at least a first end of the tube; and

a second magnetic element disposed at a first end of the

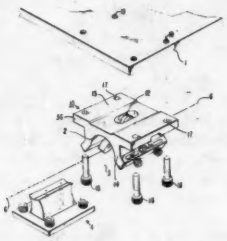
movable piece and being adapted to interact magnetically with the first magnetic element.

4,884,898

LINEAR MOTION PILLOW BLOCK INCLUDING FINE TUNING FEATURES

Robert E. Magnuson, South Orange, N.J., assignor to Lee Controls, Inc., Piscataway, N.J.

Filed Feb. 6, 1989, Ser. No. 306,588
Int. Cl.[4] F16C *29/04, 29/12*
U.S. Cl. 384—58 **20 Claims**



1. A pillow block comprising:
a body;
a primary bore having a principal axis constructed to be slideably accommodated on a primary shaft having a shaft surface;
a depending portion of said body including said primary bore having an outer surface partially surrounding said principal axis;
an axial slot disposed between said primary bore and said outer surface extending axially for a part of the axial length of said pillow block, said axial slot located at a radial distance from the axis of said primary bore;
said slot defining with the outer surface of said depending portion a bearing support plate having a bearing support surface;
at least one bearing mount on said bearing support surface;
at least one bearing mounted on said bearing mount, the bearing having a circumferential bearing surface disposed to make tangential contact with the primary shaft surface; and
means to adjust the radial distance of said bearing support plate relative to the principal axis of said primary bore.

4,884,899

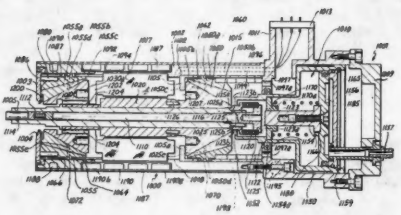
RESILIENTLY MOUNTED FLUID BEARING ASSEMBLY

Everett H. Schwartzman, 2751 Toledo St., Unit #309, Torrance, Calif. 90503

Division of Ser. No. 35,627, Apr. 3, 1987, Pat. No. 4,828,403.
This application Jan. 25, 1989, Ser. No. 301,459
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—100 **12 Claims**

1. A resiliently mounted fluid bearing system for use at relatively high rotational speeds comprising:
support means,
shaft means having an axis of rotation and including spaced portions forming spaced journals having outer surface portions and arranged along the axis thereof,
at least two axially spaced bearing means mounted in spaced relation in said support means and surrounding said shaft means at spaced positions along the axis thereof,
each said bearing means including an inner surface portion which is in spaced relation to the outer surface portion of said spaced journals to form a fluid gap therebetween such that the fluid in said gap supports said shaft for rotation with respect to said spaced bearing means,
each said bearing means including an outer bearing surface portion in opposed spaced relation to said support means,
each said bearing means including resilient means cooperating with said support means and surrounding the outer bearing surface of each said bearing means for mounting each said bearing means resiliently with respect to said support means,
at least one machine spring associated with at least one said resilient means for urging the same axially;
means to introduce fluid under pressure into the fluid gap and for exit of fluid out of said gap;
said bearing system being part of a spindle assembly; and
said shaft including a rotor and said support means supporting a stator for effecting rotation of said rotor.

5. A spindle assembly including a resiliently mounted fluid bearing system wherein said spindle assembly is adapted for use at relatively high rotational speeds comprising:
housing means,
shaft means having an axis of rotation and including spaced portions forming spaced journals having outer surface portions and arranged along the axis thereof,
at least two axially spaced bearings means mounted in spaced relation in said support means and surrounding said shaft means at spaced positions along the axis thereof,
each said bearing means including an inner surface portion which is in spaced relation to the outer surface portion of said spaced journals to form a fluid gap therebetween such



that the fluid in said gap supports said shaft for rotation with respect to said spaced bearing means,
means to effect rotation of said shaft,
tool holding and releasing means mounted on said shaft on one end thereof and rotatable therewith,
each said bearing means including an outer bearing surface portion in opposed spaced relation to said housing means,
each said bearing means including resilient means cooperating with said housing means and surrounding the outer bearing surface of each said bearing means for mounting each said bearing means resiliently with respect to said housing means,
each said resilient means including resiliently biased relatively low friction inner and outer surface support portions,
the inner surface support portion of said resilient means continuously surrounding and contacting said outer cylindrical surface portion of said bearing means,
the outer surface support portion of said resilient means continuously contacting said housing means,
means forming liquid passageways for flow of cooling fluid through said spindle and bearing for cooling thereof,
means to introduce fluid under pressure into the gap between each of said journals and associated bearing means,
machined spring means associated with at least one of said bearing means, and
means to effect exit of all of said fluid from said one end thereof.

4,884,900

FRACTURE SPLITTING OF LIGHT METAL COMPONENTS

Jean P. Pirault, Shoreham by Sea; Mervyn Rowbotham, Aldham, and David A. Biggs, Billericay, all of United Kingdom, assignors to Ford Motor Company, Dearborn, Mich.

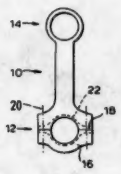
PCT No. PCT/GB87/00293, § 371 Date Dec. 27, 1988, § 102(e) Date Dec. 27, 1988, PCT Pub. No. WO87/06509, PCT Pub. Date Nov. 5, 1987

PCT Filed May 1, 1987, Ser. No. 294,148

Claims priority, application United Kingdom, May 3, 1986, 8610906

Int. Cl.[4] F16C *35/00, 33/64*

U.S. Cl. 384—434 3 Claims



1. A light metal component formed in a single piece and which has an aperture in the component, the aperture being entirely surrounded by the metal of the component, wherein a fracture zone is incorporated in the metal surrounding the aperture, with a brittle material incorporated in the component at the fracture zone so that the component can be split at the fracture zone, substantially without any ductile deformation, to separate a cap portion from the rest of the component to allow a separate component to be introduced into the aperture, whereupon the cap portion can be reunited with the rest of the component to close the aperture around the separate component, said brittle material being in the form of a brittle metal introduced as an armature of wire positioned where the brittleness is needed, with the light metal of the component cast around the wire so that the wire is included in the desired part of the component.

4,884,901

BEARING WITH ANGLE ENCODING

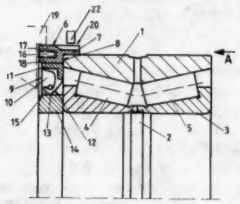
Ortwin Harsdorff, Zell, Fed. Rep. of Germany, assignor to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,754

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1987, 3733495

Int. Cl.[4] F16C *19/38*

U.S. Cl. 384—448 9 Claims



1. A sealed bearing arrangement having angle code means scannable by a sensor, comprising a bearing race, rolling elements in the race, at least one sealing ring for sealing off the bearing race and rolling elements against contamination, and a sealing retention ring attached to said bearing race for retaining said sealing ring on the bearing, and means on the sealing retention ring for providing the angle code means.

4,884,902

ROLLER BEARING EXECUTING SWIVEL MOTIONS WITH DEVICE FOR THE SYNCHRONOUS GUIDANCE OF THE BEARING CAGE

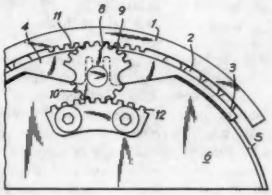
Klaus Kispert, and Robert Stolz, both of Schweinfurt, Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,617

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1987, 3737386

Int. Cl.[4] F16C *19/50, 32/00*; F01B *13/04*

U.S. Cl. 384—550 5 Claims



1. A roller bearing construction for performing a swivel motion including means for synchronously guiding the roller bearing cage, said construction comprising a roller bearing including a plurality of toothed parts thereof, a roller bearing cage, a journal, a rotatable pinion gear means for flexibly and elastically mounting said pinion gear to said cage in the direction of the circumference of the cage, said pinion gear having teeth which mesh with at least one set of said toothed parts on said bearing parts of said roller bearing.

4,884,903

INTER-SHAFT BEARING FOR MULTIPLE BODY TURBO-ENGINES

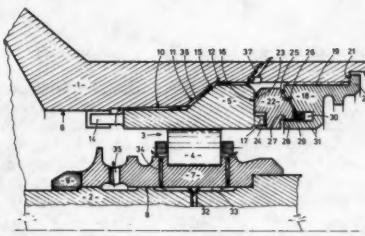
Lucien Pham, Le Mee sur Seine, and Jean-Claude C. Taillani, Evry, both of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A.", Paris, France

Filed Mar. 30, 1989, Ser. No. 330,477

Claims priority, application France, Mar. 30, 1988, 88 04162

Int. Cl.[4] F16C *25/08, 33/66*

U.S. Cl. 384—563 5 Claims



1. An inter-shaft bearing assembly in a multiple body turbo-engine including an outer first shaft and an inner second shaft, said inter-shaft bearing assembly supporting said first shaft for rotation relative to said second shaft and comprising:

an inner ring mounted on the outer face of said second shaft,

an outer ring mounted on the inner face of said first shaft, said outer ring having upstream and downstream ends relative to the direction of gas flow through the turbo-engine,

a plurality of bearing rollers disposed between said inner and outer rings,

at least one conical surface on the outer face of said outer ring,

at least one conical surface on said inner face of said first shaft adapted to cooperate with said at least one conical surface of said outer ring,

a retaining nut mounted on said first shaft downstream of said outer ring,

a plurality of fly-weights disposed between said retaining nut and said downstream end of said outer ring, each of said fly-weights having a generally trapezoidal shape in cross-section providing said fly-weight with an inclined face on its downstream side, and

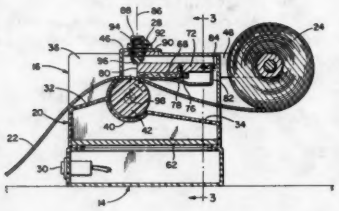
a conical surface on the upstream face of said retaining nut adapted to cooperate with said inclined faces of said fly-weights whereby, during operation of said turbo-engine, radially outward centrifugal movement of said fly-weights exerts an axial thrust on said outer ring as a result of cooperation between said inclined faces of said fly-weights and said conical surface of said retaining nut, said axial thrust acting to restrain the bearing formed by said inner and outer rings and said bearing rollers therebetween through the cooperation of said at least one conical surface of said outer ring and said at least one conical surface of said first shaft, thereby controlling the play likely to develop between said outer ring and said first shaft as a function of the rotational speed of said turbo-engine.

4,884,904

BAR CODE PRINTER

John F. Berquist, Atascadero, Calif., assignor to Cognitive Solutions, Inc., Atascadero, Calif.

Filed Dec. 9, 1987, Ser. No. 131,406
Int. Cl.[4] B41J *3/20*
U.S. Cl. 400—120 **3 Claims**



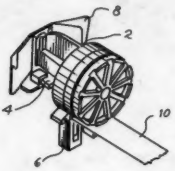
1. In a thermal printer having a mounting body, a feeding platen rotatably mounted by the body, a printhead and supporting means for positioning the printhead in printing contact with a printing medium at a contact location backed by the platen under a spring bias, said supporting means including a support frame on which the printhead is carried in fixed relation thereto and spring means mounted by the body in operative engagement with the support frame for applying said spring bias only to said contact location at which frictional feed engagement between the printing medium and the platen is established, said support frame including a rigid element having opposite end portions, pivot means on the element adjacent one of the end portions thereof for pivotal mounting thereof by the body, and a carrying portion on the element extending to the other of the end portions thereof on which the printhead is fixedly mounted; means mounting the spring means on the body in overlapping relation to the element at said other of the end portions, said spring bias being transmitted through the element to the printhead at said other of the end portions; and said body comprising a housing section exclusively mounting the platen, the spring means and the supporting means, and a base to which said housing section is secured, housing section having an intermediate recessed portion through which said web extends and opposite end bearing portions within which the platen is rotatably supported, said spring mounting means being secured to the end bearing portions bridging the intermediate recessed portion.

4,884,905

PRINT HEAD INCORPORATING ONE PIECE ARMATURE WITH INTERMEDIATE CLAMPING PADS

Normand C. Smith, Charlotte, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 1,620, Jan. 9, 1987, abandoned. This application Feb. 19, 1988, Ser. No. 158,188
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **17 Claims**



1. A print head for a dot matrix printer comprising:

a frame assembly;

a print wire assembly including a print wire (rod) having one end for driving a ribbon against a record medium and a second end including a print wire head and a (sprint) spring where said spring is compressed between said head and a spring-seat in said frame assembly:

a stator assembly including a cup having a plurality of posts, a plurality of coil assemblies, each of said posts surrounded by one of said coil assemblies, a flux plate mounted on said cup and coil assemblies, and a residual mounted on said flux plate (and a signal means connected to said coil assemblies for selectively activating each of said coil assemblies);

a one piece armature constructed of thin sheet metal having a flexible periphery with a plurality of rigid radial arms connected at said periphery by a bent arm base having a cutout section for relieving bending stresses and radiating inwardly therefrom for driving said wire against said ribbon in opposition to the bias of said spring, each of said rigid radial arms having folded flanges to provide rigidity, said flexible periphery further having clamping pads only between said rigid radial arms for clamping said one piece armature into fixed contact with said cup of said stator assembly through said residual and said flux plate, said rigid radial arms biased away from said head end of said print wire by the torsional action of the bent arm base due to the clamped pads only between the radial arms of said of said flexible periphery; (and radiating inwardly therefrom for driving said print wire assembly in a forward direction, each of said rigid radial arms having a pair of flanges folded to provide rigidity, each of said rigid radial arms associated with said arm base, each of said arm bases having a pair of cut out portions for relieving stress and a slight bend between said cut out portions for biasing said associated rigid radial arm in a rearward direction against a backstop, the rearward biasing of said rigid radial arm being supplied by a combination of torsional action in said flexible periphery, a fixed clamping action of a cap and a rearward bend at said arm base);

a plurality of posts affixed to said one piece armature, one of said posts affixed to each of said rigid radial arms and extending opposite said flanges into a cavity of said coil assemblies, said post being constructed of a high permea-

bility, high saturation level, low coercive force magnetic material; and

electronic means for selectively activating and deactivating each of said coil assemblies, each of said coil assemblies, when activated, driving said associated rigid arm against one of said print wire heads and returning said rigid arm to a rest position when said coil assembly is deactivated.

4,884,906

SERIAL PRINTER WITH A SINGLE TYPE WHEEL

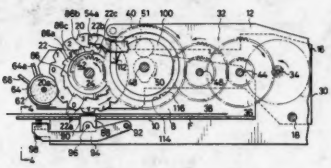
Morio Yamaguchi, Funabashi, Japan, assignor to Max, Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,756

Claims priority, application Japan, Feb. 27, 1987, 62-28263[U]; Feb. 28, 1987, 62-29449[U]; Mar. 19, 1987, 62-40296[U]

Int. Cl.[4] B41J *1/42*

U.S. Cl. 400—162.3 18 Claims



1. A serial printer, comprising:

a fixed frame;

a rocking frame supported by one end of the fixed frame and rockable relatively to the fixed frame between a first position, in which a sheet passage for a printing sheet, defined between the fixed and rocking frames, is opened to allow the printing sheet to be inserted freely thereinto, and a second position, in which said sheet passage is closed, said rocking frame being further rockable from the second position to a third position on the opposite side thereof to the first position, said sheet passage being closed in the third position;

a sheet holding mechanism for applying a holding force to the printing sheet in the sheet passage as the rocking frame rocks from the first position to the second and third positions;

a single drive motor;

a single type wheel rotatably supported by the rocking frame and having its axis of rotation fixed with respect to the rocking frame, said type wheel being unable to move along the axis of rotation thereof;

rotary drive transmission means disposed on the rocking frame and transmitting the rotatory force of the drive motor to the type wheel, thereby rotating the type wheel, said transmission means including a main rotating member having at least three separate rotational angular ranges, including first, second, and third ranges, within an entire 360 degree rotation thereof;

a type selection mechanism for performing type selection on the type wheel in cooperation with the main rotating member while said rotating member is rotating through the first rotational range;

a printing mechanism for performing printing operation by means of the type wheel by rocking, in cooperation with the main rotating member, the rocking frame from the second position to the third position while said main rotating member is rotating through the second rotational angular range next to the first rotational angular range; and

a sheet feed mechanism for performing sheet feed operation to feed the printing sheet in the sheet passage along a print line which is substantially parallel to said axis of rotation of the type wheel, in cooperation with the main rotating member, while said main rotating member is rotating through the third rotational angular range next to the second rotational angular range.

4,884,907

MECHANISM FOR SHIFTING THE TRACK POSITION OF A MULTI-TRACK INK RIBBON IN A PRINTER

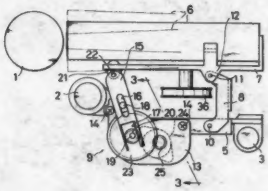
Yoshiyuki Yasumi, Iwate, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 86,371, Aug. 17, 1987, abandoned. This application Dec. 6, 1988, Ser. No. 282,920

Claims priority, application Japan, Oct. 27, 1986, 61-163554

Int. Cl.[4] B41J *35/16*

U.S. Cl. 400—216.1 3 Claims



1. In a ribbon track selecting mechanism for use with a printer having a ribbon cassette table with a ribbon cassette supported on an upper side thereof, the ribbon cassette containing a ribbon on a front side thereof facing a platen, wherein the ribbon is provided with a plurality of color tracks extending in a length direction of the ribbon and arranged in order vertically in a width direction of the ribbon, a carriage movable in a longitudinal direction along the platen, wherein the ribbon cassette table is supported vertically above the carriage and is shiftable by the ribbon track selecting mechanism in a vertical direction perpendicular tφ the longitudinal direction, in order to shift a selected one of the color tracks of the ribbon to a printing positon in front of the platen;

the improvement wherein said ribbon track selecting mechanism comprises:

a pair of support arms oriented in the vertical direction having one of their ends pivotally mounted to opposing lateral sides of said ribbon cassette table in the longitudinal direction and positioned toward a rear side of said ribbon cassette table remote from said platen, and having the other of their ends pivotally supported on said carriage, wherein said support arms may pivot freely to support movement of said rear side of said ribbon cassette table in the vertical direction;

ribbon driving means mounted on a bottom side of said ribbon cassette table toward the rear side thereof adjacent said support arms, said ribbon driving means being drivingly connected to said ribbon cassette;

a drive mechanism including a drive plate having one end pivotally mounted to a front side of said ribbon cassette table toward said platen, and a stepping motor mounted on said carriage below said ribbon cassette table and driving a drive gear engaged with engagement means on the other end of said drive plate, wherein said one end of said drive plate on the front side and said one ends of said support arms on the rear side of said ribbon cassette table define a plane which is selectively shiftable in the vertical direction by said drive mechanism to bring the selected one of the color tracks of the ribbon in said ribbon cassette to the printing position; and

a detent mechanism for stopping and holding said drive plate in selected shift positions corresponding to positioning the color tracks, respectively, at the printing position, said detent mechanism including a detent cam rotatable on an axis together with said drive gear and having a cam sur-

face formed with detent recesses corresponding to the selected shift positions of the color tracks, and a detent member for engaging in the corresponding one of said detent recesses of said detent cam at each selected shift position.

4,884,908

OVERLAPPINGLY OVERSTRIKEABLE RIBBON AND USE THEREOF IN CONTINUOUSLY FULL CASSETTES

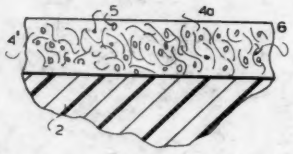
Hans Paffhausen, Franklin, Tenn.; Ian Hogarth, Turriff; Andrew Scott, Turriff, and Christine Mackintosh, Turriff, all of Scotland, assignors to Caribonum Ltd., Scotland, Scotland

Continuation-in-part of Ser. No. 103,527, Sep. 30, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 226,563

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635114

Int. Cl.[4] B41J *31/00*

U.S. Cl. 400—241.2 **8 Claims**



1. An impact-transfer overlappingly overstrike ribbon capable of hundreds of overlapping strikes in single-pass use, said ribbon comprising:

a carrier film forming a support; and

a filler-free color-releasing layer on said support, said filler-free color-releasing layer consisting essentially of:

a dye component consisting of at least one fatty dye and-/or one oil-soluble dye,

polyethoxylated fatty acid ester with approximately 12 to 25 C-atoms and alcohols with 3 to 6 OH-groups which contain approximately 4 to 60 ethoxy groups in the molecule,

a plastic matrix in which the dye component solubilized in the polyethoxylated fatty acid ester containing 4 to 60 oxyethylene groups per molecule is dispersed, and

optionally carbon black or another pigment of a color compatible with that of the color of said color-releasing layer.

4,884,909

RECORDING APPARATUS

Yoshitaka Watanabe, Tokyo; Yoshiyuki Mizoguchi, Yokohama, and Hiroyuki Hiraga, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,370

Claims priority, application Japan, Dec. 25, 1986, 61-307905; Dec. 25, 1986, 61-307906

Int. Cl.[4] B41J *11/58, 13/10*

U.S. Cl. 400—625 **5 Claims**

1. A recording apparatus comprising:

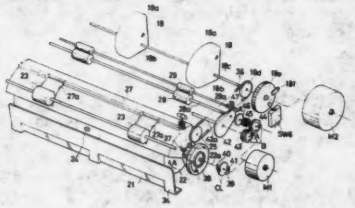
a platen roller for feeding a sheet to be subjected to a recording operation;

a motor for providing a driving force in two directions;

a first transmission mechanism having a one-way clutch for transmitting the driving force of said motor to said platen roller only in a first driving direction of said motor;

a discharge roller for discharging a recorded sheet, said discharge roller being movable between a first position in which the recorded sheet can be discharged by said discharge roller and a second position in which the recorded sheet cannot be discharged by said discharge roller; and

a second transmission mechanism for transmitting the driving force of said motor to said discharge roller in a second driving direction of said motor, said second transmission mechanism including a moving mechanism for moving transmission mechanism including a moving mechanism for moving said discharge roller to the second position



when said motor is driven in the first driving direction and moving said discharge roller to the first position when said motor is driven in the second driving direction.

4,884,910

MECHANICAL PENCIL

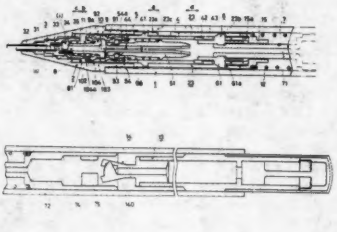
Hidehei Kageyama; Yoshihide Mitsuya, and Yoichi Nakazato, all of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Mar. 22, 1988, Ser. No. 171,881

Claims priority, application Japan, Apr. 17, 1987, 62-94905; May 2, 1987, 62-67101; May 2, 1987, 62-67102; May 2, 1987, 62-67103; Jun. 23, 1987, 62-155777; Sep. 25, 1987, 62-145438

Int. Cl.[4] B43K *21/02*

U.S. Cl. 401—65 **14 Claims**



1. A mechanical pencil including:

a tip member fitted in the front end of a shell;

a sleeve disposed slidably in the interior of said tip member;

a lead feed mechanism which is mounted in the interior of said sleeve and which permits a forward movement of a lead but inhibits a backward movement of the lead;

an ejection bar mounted on the front end side of said sleeve, with the lead extending through the ejection bar;

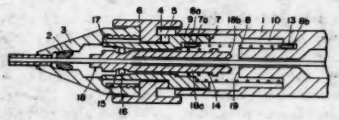
a slider disposed slidably within said tip member and having a locking engaging portion capable of engaging said tip member disengageably, said slider imparting a predetermined frictional force to the lead; and

a resilient member disposed between said slider and said ejection bar, said resilient member having an urging force stronger than a lead gripping force of said lead feed mechanism, wherein a drum ring is provided on the front end side of said sleeve, and said ejection bar is disposed slidably within said drum ring.

4,884,911
MECHANICAL PENCIL WITH LATCHING CHUCK ACTUATOR

Hideaki Oikawa, Kasukabe, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 263,801
Int. Cl.[4] B43K *21/16, 21/06, 24/04*
U.S. Cl. 401—65 5 Claims



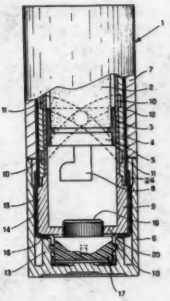
1. A mechanical pencil comprising:
a tubular casing;
a centrally apertured conical tip piece connected to an end of said tubular casing to form a pencil tip and having a lead retainer for frictionally holding the lead therein;
a lead engaging chuck device longitudinally movably mounted within the tubular casing to grasp the writing lead;
a chuck actuator longitudinally movably mounted within said tubular casing:
first spring means for biasing said chuck device rearwardly relative to said chuck actuator;
second spring means for biasing said chuck actuator forwardly and circumferentially relative to said tubular casing;
actuation knob means, longutudinally movably mounted on said tubular casing, for circumferentially rotating said chuck actuator against a force of said second spring means;
engagement means for slidably engaging said chuck actuator to said actuation knob to rotate said chuck actuator against a force of said second spring means; and
locking means for locking said chuck actuator to prevent a further rotation of said chuck actuator to thereby release the engagement between said actuation knob and said chuck actuator;
whereby when the engagement between said actuation knob and said chuck actuator is released, said chuck device and said chuck actuator are moved rearwardly together with said actuation knob against a resilient force of said second spring means until said chuck contacts a portion of said tubular casing.

4,884,912
MAKE-UP APPLICATOR HAVING A REPLACEABLE PRODUCT CARTRIDGE

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Sep. 17, 1986, Ser. No. 908,202
Claims priority, application France, Oct. 3, 1985, 8514667
Int. Cl.[4] A45D *40/00, 40/04, 40/18*
U.S. Cl. 401—78 15 Claims

1. An applicator for a pasty product in stick form, comprising:
(a) an inner tubular casing;
(b) means defining at least one slide to said inner tubular casing;
(c) a base member to said inner tubular casing;
(d) a plunger adapted to receive a stick of the pasty product;
(e) means slidingly mounting said plunger in said inner tubular casing for movement therealong;
(f) stud means to said plunger, said stud means being engaged in said at least one slide;
(g) an outer tubular casing coaxial with said inner tubular casing, said outer tubular casing having a part abutting said base member of the inner tubular casing;
(h) a wall to said outer tubular casing;
(i) means defining at least one helical groove in said wall, said at least one groove being associated with and adjacent said slide, said stud means of the plunger being engaged in said at least one helical groove;
(j) a base outside said base member of the inner tubular casing;
(k) means fastening said base to said inner tubular casing for conjoint rotation with the inner tubular casing and its base member; and
(l) a cap covering the outer tubular casing and abutting said base;

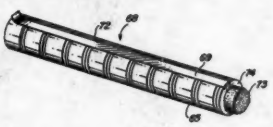


wherein said fastening means comprise a jacket arranged between the base member of said inner tubular casing and said base, and
said applicator additionally comprising ballast means arranged between said base and the bottom of said base member;
said jacket surrounding said part of the outer tubular casing which abuts said base member of the inner tubular casing, thus exerting a braking pressure on said outer tubular casing, said base, adjacent said outer tubular casing including a recess providing a clearance between said base and said jacket assuring that the force of the braking will not be effected by pressure of said outer tubular casing on said base.

4,884,913
NAIL POLISH REMOVER WAND CONTAINING DISPOSABLE PADS

Louise Smith, 855 E. Butler, Phoenix, Ariz. 85020, and Frank W. Kautman, P.O. Box 47837, Phoenix, Ariz. 85038

Division of Ser. No. 163,622, Mar. 3, 1988, which is a continuation-in-part of Ser. No. 123,238, Nov. 20, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 331,865
Int. Cl.[4] A45D *29/17*
U.S. Cl. 401—196 4 Claims



1. An assembly of nail polish removing applicators capable of dispensing nail polish solvent comprising:
a plurality of individual applicators arranged in a longitudinal array,

a tear away strip adhesively attached to said array along its length on the outer periphery of said applicators,

said strip holding said applicators together until said array is placed in a nail polish removing wand at which time it is removed, means forming a part of each of said applicators for engaging a juxtapositioned applicator in the array for aiding in holding them in an elongated longitudinal configuration,

said applicators each comprise a substantially rigid first part secured to a second part comprising an absorbent pad, and

said applicators also comprising positioning means on their periphery for aiding in holding the applicator in an exposed position in an end of a nail polish removing wand.

4,884,914

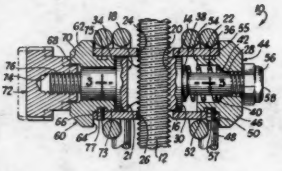
ADJUSTABLE AND LOCKABLE SCREW SPINDLE SUPPORT DEVICE

William E. Shultz, 239 N. Main St., Lombard, Ill. 60148

Filed May 23, 1988, Ser. No. 198,187

Int. Cl.[4] F16B 7/18

U.S. Cl. 403—118 **28 Claims**



1. A threaded rod supporting device for receiving a threaded rod and supporting the rod in a desired position longitudinally with respect to said support device comprising:

a housing having an aperture adapted to receive the threaded rod, said aperture including a relatively smooth wall defining one edge of the housing aperture, said smooth wall adapted to engage some of the threads on the threaded rod when the device is in a locked position;

a slide member movable longitudinally within said housing such that by moving said slide means in a direction toward and away from said relatively smooth housing aperture wall said threaded rod is movable into and out of engagement with said housing aperture wall to lock and unlock said threaded rod with respect to said housing;

a threaded rod disposed within the housing aperture and within the slide member: and

means for moving said slide member longitudinally within said housing for engagement and disengagement of said threaded rod with said housing aperture wall.

4,884,915

JOINTING DEVICE PRIMARILY FOR SCAFFOLD OR STAND SYSTEM

Peter Camitz, Sigtunagatan 9, S-113 22 Stockholm, Sweden

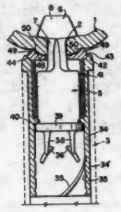
Filed Jan. 23, 1987, Ser. No. 14,059

Claims priority, application Sweden, May 24, 1985, 8502598

Int. Cl.[4] F16B 7/00

U.S. Cl. 403—171 **7 Claims**

1. A jointing device for scaffolding or stand systems, for example in exhibition show cases the the like, which system is assembled of tubes, each tube having essentially equal inner and outer diameters relative to the other tubes, where the jointing device is a junction, to which at least one tube is adapted to be attached, and any said tube is intended with one end to co-operate with the jointing device; said jointing device includes a substantially spherical junction member and connecting means adapted to be inserted in a tube at one of its ends and to be fastened in the tube, and including a pull rod provided to co-operate with said substantially spherical junction member, which junction member is thereby fixed on the tube and arranged for co-operation with more than one pull rod and its associated connecting means and its associated tube; and end of the pull rod which will co-operate with said substantially spherical junction member comprising: an axially extending portion and an outer transverse portion, thereby forming a substantially T-shaped portion, where the T-shaped portion is considerably thinner in the cross-section dimension in a direction perpendicular to the planar T-shape, than is the dimension of the transverse part of the planar T-shape, and that the junction member is provided with an inner cavity and comprises at least one longitudinal slit-shaped lead-in passage for the T-shaped end portion of a pull rod, so constructed that the elongate dimension of the lead-in passage exceeds the transverse part of the T-shaped portion and the width of the lead-in passage slightly exceeds the extension of the T-shaped portion in its said cross-section thickness direction; said jointing device also including a substantially sleeve-shaped attachment member, being provided on said pull rod end, to be inserted and fastened in said tube at the end thereof and to co-operate with the junction member, said attachment member comprising internal, circumferentially spaced and at least partially axially



extending stop means, and said pull rod (5) comprising at least one stop member (30, 36) arranged to co-operate with said stop means so that the pull rod is maintained in fixed axial position relative to said sleeve-like attachment member, and can be rotated about the axis of and relative to the sleeve-like attachment member in one predetermined rotational direction, but substantially prevented from rotation in the opposite rotational direction; said portions of said stop means (29, 35) intended to co-operate with a stop member are extended at least partially axially and said stop member is arranged in the same at least partially axially disposition relative to the stop means; and wherein, in connection to the end (42) of the sleeve-shaped attachment member (34) facing the junction member, an inner sleeve (41) is located in the sleeve-shaped attachment member, which inner sleeve comprises axially extending inner guide members (46), which are alternating bars and grooves, for cooperation with the pull rod (5) to render possible, axial movement of the pull rod without simultaneously rotating the same in a predetermined direction; and said pull rod (5) which cooperates with said guide members (46) of the inner sleeve (41) is provided with at least two substantially axially extending, supporting arms (52) including stop shoulders (53).

4,884,916

SYSTEM FOR MOUNTING A POWER TRANSMISSION MEMBER TO A SHAFT

Harold R. Johnson, III, Aberdeen, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 23, 1988, Ser. No. 289,249

Int. Cl.[4] B25G 2/00, 3/20

U.S. Cl. 403—370 **16 Claims**

16. A structural mounting assembly for mounting the disk portion of a gear on a rotational shaft comprising:

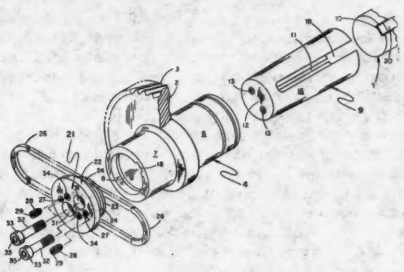
a longitudinally extending, hollow, open-ended quill fixed to said disk portion to extend centrally and normally therethrough with the longitudinally extending quill member

having a first portion extending a longer, preselected, longitudinal distance from one face of said disk portion than the extending longitudinal distance of said remaining second portion of said quill from the opposite face of said disk portion, said second portion having an annular internal groove positioned a preselected distance from the outer extremity thereof;

a longitudinally extending, hollow, longitudinally split bushing sized and adapted to be inserted through the open end of said first portion of said hollow quill a preselected longitudinal distance from the opposite end of said remaining portion of said hollow, open-end quill, said opposite end of said bushing having a cap closing member integral therewith;

said quill having a tapered inner bore extending longitudinally along said quill and converging inwardly toward the axis of rotation of said assembly from the open end of said quill toward the other end, and said hollow bushing having an outer tapered surface extending longitudinally along said bushing and converging inwardly also toward the axis of rotation of said structural assembly from the open end of said bushing toward said cap end to be received within said quill with the outer tapered surface of said bushing contacting in snug fit relation with the tapered inner bore surface of said quill;

said inner bore of said hollow split bushing being sized and adapted to snugly grip one end of said rotational shaft extending therein;



aligned key and slot fittings extending longitudinally along the inner bore of said hollow quill, through the wall of said bushing and along the outer peripheral surface of said rotational shaft;

an adapter mounted at the open end of the remaining shorter portion of said quill including integral flange and plug portions sized so that said plug portion removably engages snugly with the internal bore opening of said hollow quill with the plug extremity adjacent said cap closing member of said bushing and the flange portion abutting said quill opening extremity of said remaining shorter portion of said quill, said plug portion having an annular peripheral groove extending therearound a preselected distance from said flange portion to be aligned with said annular groove in the inner bore of said shorter portion of said quill;

a pair of substantially semi-circular ring members sized to be disposed in opposed relation in said annular peripheral groove of said plug member;

said adapter including two spaced, longitudinally extending, internally threaded apertures therein to allow threaded passage therethrough of externally threaded holding screws with tapered, peripherally slotted extremities to engage with and hold said ring members in a first position during assembly and in a second position when in radial engagement with said aligned annular groove of said hollow quill;

said adapter including a first pair of spaced, longitudinally extending, countersunk apertures therein to allow free passage of the shank portions of externally threaded headed fastening screws therethrough to respectively engage in male-female relation with a pair of equally spaced internally threaded apertures in said bushing cap to connect said bushing cap to restrain longitudinal movement between said bushing and said adapter;

said adapter further including a second pair of spaced apertures equally sized in cross-section to said first pair of apertures and internally threaded to allow the shank portions of said threaded fastening screws to alternatively be threaded therethrough with the extremities thereof abutting said cap of said bushing to initiate relative releasing movement between said bushing and said quill in which said bushing is snugly engaged in assembly.

4,884,917

FLOW MODIFICATION AT THE BIFURCATION OF A BRANCH CHANNEL FROM A MAIN CHANNEL CARRYING A WATER FLOW

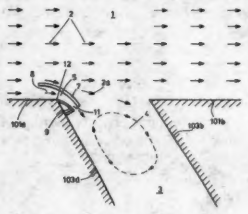
Hermann Christiansen, Bucholz, Fed. Rep. of Germany, assignor to Robert Kirby, United Kingdom

Filed Mar. 3, 1988, Ser. No. 163,838

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1987, 3707074

Int. Cl.[4] E02B *3/00*

U.S. Cl. 405—80 **13 Claims**



1. The combination of a main channel carrying a main water flow in an upstream to downstream direction, a branch channel birfurcating from said main channel to define both an upstream corner and a downstream corner of the entrance to the branch, flow deflecting means located adjacent the upstream corner for deflecting a minor proportion of said main water flow from the main channel into the branch channel so as to oppose the formation of eddies in the branch channel in the region of said bifurcation and thereby diminish the deposition of sediment in said region.

4,884,918

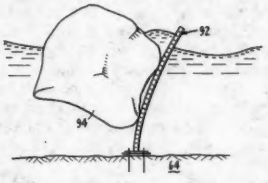
METHOD AND APPARATUS FOR CELLULAR CONSTRUCTION STRUCTURE

Paul Gulbenkian, P.O. Box 42105, San Francisco, Calif. 94142

Continuation of Ser. No. 732,360, May 8, 1985, abandoned. This application Jun. 29, 1987, Ser. No. 68,272

Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—202 **13 Claims**



1. A structure comprising

a plurality of substantially similar concrete cubes, each having walls of predetermined thickness which enclose a hollow interior so that each cube is floatable in water when the hollow interior is filled with air, wherein the cubes are juxtaposed to one another so that each cube has a plurality of wall each of which is positioned in a different plane, and so that for a particular plane there is a corresponding wall of an adjacent cube positioned therein;

means for maintaining the walls of adjacent cubes in contact with each other and for posttensioning the walls, including, for walls lying in a common plane,

a common plurality of tendons positioned to be parallel to the common plane and extending through said walls lying in said common plane, wherein said common plurality of tendons includes a first plurality of tendons and a second plurality of tendons positioned at approximate right angles to said first plurality of tendons, and further wherein said common plurality of tendons are placed under predetermined amounts of tension to posttension the walls in the common plane in two dimensions and further wherein the posttensioning provided to walls of the cubes which are positioned in planes which are at approximate right angles to said common plane collectively posttension in a third dimension, each of said walls lying in said common plane; and

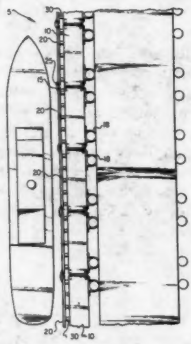
means communicating with each cube for controllably filling liquid into or evacuating liquid from the cube so as to modify the buoyancy of the concrete structure.

4,884,919

PIER CUSHIONING SYSTEM

Joe T. Moore, 1601 Amhurst Dr., Arlington, Tex. 76014

Filed Feb. 23, 1989, Ser. No. 299,460
Int. Cl.[4] E02B *3/22*
U.S. Cl. 405—212 **11 Claims**



7. A pier cushioning system for protecting a pier from docking vessel comprising:

a segment having a contact surface;

a plurality of sliding elements connected to the contact surface of the segment for transmitting force;

a plurality of hydraulic cylinders having a shaft with an end piece connected to the sliding elements and cylinder piston containing hydraulic fluid connected to the shaft for absorbing energy transmitted from the sliding elements;

a valve assembly associated with the hydraulic cylinders and having means for controlling the flow of the hydraulic fluid;

means associated with the valve assembly for determining the mass and velocity of the docking vessel; and

structural components connected to the hydraulic cylinders for transmitting the force absorbed by the hydraulic cylinder to the pier.

4,884,920

SET OF CONSTRUCTION ELEMENTS

Edgar Perazzi, CD 79 Laval, 06220 Greolieres, France

Continuation of Ser. No. 933,541, Nov. 21, 1986, abandoned.
This application Oct. 27, 1988, Ser. No. 266,206
Claims priority, application France, Nov. 27, 1985, 85 16630
Int. Cl.[4] E02D *29/02*
U.S. Cl. 405—284 **12 Claims**

1. A structural wall comprising vertically stacked horizontal rows each comprised of alternating first and second hollow construction elements of respective first and second sets of identical elements with said first and second construction elements of said rows being stacked in columns of said first and second elements respectively, each of said elements of said rows being contiguous with each adjacent element of the row, said first set of alternate construction elements each having a circular convexly curved outer wall extending around the element, and said second set of alternating elements each having four concavely curved vertical walls the chordal planes of which extend along the sides of a rectangular solid with each of the walls being concave on the exterior and having substantially the same curvature as the convexly curved elements of the said first set of construction elements to provide for relative angular position movement between the contiguous elements of a row to accommodate angular relationships between adjacent portions of the wall, said concave surfaces of said second set of elements extending for about a quarter circle, each of said elements of said first and second sets have spaced vertical grooves in the outer walls thereof which are aligned in said columns and tie rods in respective aligned grooves of a column interconnecting the elements of the column.

4,884,921

RETAINING WALL MODULE HAVING FACE PANEL AND T-STEM WITH MEANS FOR RECEIVING TRANSVERSE STABILIZING WEB

Peter J. Smith, Gansevoort, N.Y., assignor to Fomico International, Inc., Fort Edward, N.Y.

Filed Sep. 15, 1988, Ser. No. 244,684
Int. Cl.[4] E02D *29/02*
U.S. Cl. 405—286 **9 Claims**

1. A precast concrete module for constructing a retaining wall, the module including:

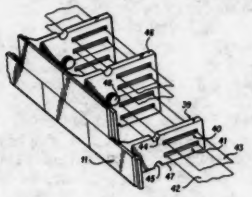
a face panel having a front face, a rear face, side edges, a top edge, and a bottom edge;

a single retaining stem having opposite side faces, a front end, a rear end, a top surface, and a bottom surface parallel to the top surface; and

means connecting the front end of the retaining stem to the rear face of the face panel, wherein the improvement comprises:

the front end of the retaining stem being connected to the

rear face of the face panel at a location spaced from one side edge of the face panel by one quarter of the distance



between the one side edges and the other side edge of the face panel.

4,884,922

FILLING CRACKS IN ARTIFICIAL AND NATURAL STRUCTURES

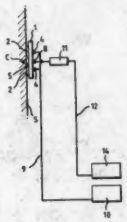
Ikram Haq, Clwyd, Wales, assignor to Balfour Beatty Limited, Surrey, England

Filed Sep. 16, 1987, Ser. No. 97,492

Claims priority, application United Kingdom, Sep. 19, 1986, 8622645

Int. Cl.[4] E02D *37/00;* E04G *23/02*

U.S. Cl. 405—303 11 Claims



1. A method of injecting hardenable material in a liquid or semi-liquid state into a void opening into an exposed surface of an artificial or natural structure, which method comprises positioning on said exposed surface of the structure a substantially rigid plate which has on the surface of the plate nearer said exposed surface of the structure at least two enclosures each bounded by an upstanding wall of a fluid-impermeable readily compressible material, at least one of which enclosures constitutes a vacuum enclosure and has at least one outlet port passing through the plate and at least one of which enclosures constitutes an injection enclosure and has at least one injection nipple passing through the plate, the rigid plate being so positioned on said exposed surface of the structure that the injection enclosure overlies the void into which hardenable material in a liquid or semi-liquid state is to be injected; evacuating air through the outlet port from the vacuum enclosure to cause the rigid plate to be sucked tightly against said exposed surface of the structure; pressure injecting hardenable material in a liquid or semi-liquid state through said injection nipple into the injection enclosure until the void is substantially filled with hardenable material; releasing the vacuum in the vacuum enclosure and removing the rigid plate from said exposed surface of the structure; and permitting or causing the hardenable material to set.

4,884,923

VEHICLE FOR BULK TRANSPORT OF POWDER-FORM, GRANULAR OR PELLET-LIKE MATERIAL

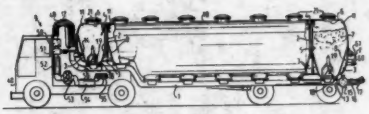
Theodorus A. Wellink, Groenlo, Netherlands, assignor to Weigro B.V., Netherlands

Filed Apr. 20, 1988, Ser. No. 184,050

Claims priority, application Netherlands, May 22, 1987, 8701241

Int. Cl.[4] B60P *1/60;* B65G *53/40, 53/46*

U.S. Cl. 406—41 15 Claims



1. A vehicle for transport of bulk material of powder, granular or pellet-like material comprising a plurality of reservoirs, means for filling each of said reservoirs with bulk material, said reservoirs having upper portions thereof interconnected with one another, a source of compressed air connected with said interconnected portions for discharging bulk material from said reservoirs, a discharge pipe including an outlet for discharging bulk material from the vehicle, said reservoirs having at a lower portions thereof discharge means for controlling discharge of material from the associated reservoirs, each of said discharge means including a first portion defining a discharge opening in communication with said discharge pipe and a second portion movable in a first direction with respect to said first portion to open the discharge means and in a second direction with respect to said first portion to close the discharge means, one of said portions carrying a resilient sealing ring, the other of said portions having a sealing surface engageable with said sealing ring to provide a substantially airtight seal when the discharge means is closed, said first portion having a first edge formed thereon, said second portion having a cutting edge formed thereon and engageable with said first edge prior to engagement of said sealing surface and sealing ring when said second portion moves in said second direction to close the discharge means to thereby break up any pellet-like or granular bulk material which might otherwise lodge between the sealing ring and the sealing surface and prevent an effective airtight seal.

4,884,924

FISH HOLD CONSTRUCTION

Mario J. Puretic, P.O. Box 58070, Tierra Verde, Fla. 33715

Continuation of Ser. No. 711,730, Mar. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 325,980, Nov. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 153,040, May 27, 1980, abandoned. This application Aug. 29, 1986, Ser. No. 901,627

Int. Cl.[4] B65G *53/44*

U.S. Cl. 406—82 10 Claims

1. A fish hold construction for a fishing vessel, said construction system comprising:

a fish alley extending longitudinally along the center line of said vessel at a lower portion thereof;

a plurality of fish storage holds disposed along the length of said vessel above said fish alley and on opposite sides thereof, said holds each having a vertically extending inner wall adjacent said fish alley and a lower wall that is inclined downwardly and inwardly whereby fish stored in said fish hold will slide along said lower wall towards said fish alley, with the help of gravity;

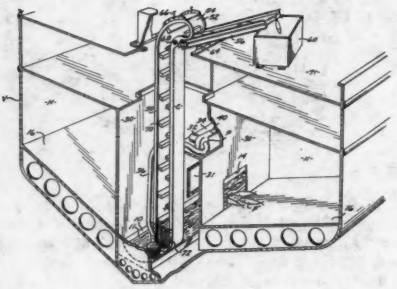
a fish discharge aperture formed in the lower portion of each of said inner walls;

selectively openable gate means for said fish discharge apertures to normally retain fish within said holds, with said

fish falling through said discharge apertures into said fish alley when said gate means are opened;

flushing means for urging fish out of said holds through said gates and into said fish alley when said gates are opened;

a power-operated fish elevating conveyor having an intake positioned within said fish alley and a discharge positioned above said alley; and



means for continuously circulating liquid through said fish alley from one end thereof towards the intake of said fish elevating conveyor to thereby direct fish falling into said fish alley from said storage holds into the intake of said fish elevating conveyor.

4,884,925

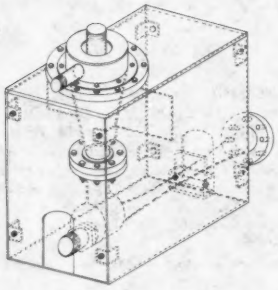
APPARATUS AND METHOD FOR TRANSFER AND SLURRYING OR DISSOLVING HYDRATABLE DRY BULK CHEMICALS

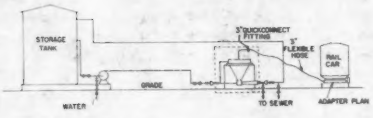
Robert A. Kemp, Syracuse; William I. Nelson, Baldwinsville, and Gary W. Foley, Syracuse, all of N.Y., assignors to General Chemical Corporation, Parsippany, N.Y.

Filed Dec. 4, 1987, Ser. No. 128,720

Int. Cl.[4] B65G *53/30, 53/38, 53/40, 53/58*

U.S. Cl. 406—109 **8 Claims**





1. A method for transporting a dry chemical out of a container and introducing the dry chemical into a liquid carrier medium comprising:

(a) connecting to the container an apparatus comprising a solvation hopper formed from a wall member, and an inlet end member and having an outlet end opposite to the inlet end; a plurality of spray nozzles disposed in the inlet end member of the hopper; means for supplying a flow of solvation liquid to the spray nozzles; a chemical inlet pipe passing through the inlet end member so as to connect the interior and the exterior of the hopper; and a liquid driven eductor having a liquid inlet pipe, a liquid outlet pipe and a suction opening, said suction opening being attached to the outlet end of the hopper, wherein the hopper is a sealed unit such that liquid flow through the eductor generates a suction within the chemical inlet pipe, and wherein the spray nozzles are oriented such that solvation liquid flowing through the spray nozzles washes the interior surface of the all member;

(b) supplying a flow of eductor liquid to the liquid driven eductor so as to such the dry chemical from the container into the hopper;

(c) supplying a flow of solvation liquid to the spray nozzles such that the dry chemical in the hopper is mixed with the solvation liquid to form wetted chemical which is sucked out of the hopper through the suction opening of the eductor; and

(d) recovering the chemical in a liquid carrier medium from the eductor outlet pipe said carrier medium comprising a combination of the solvation liquid and the eductor liquid, wherein the solvation liquid is supplied in an amount of 0.1 to 4 times the quantity "Z", where "Z" is the solvation flow rate expressed as gal/lb of solid and

$$Z = \frac{7.5\left(1 - \frac{\text{Solid Bulk Density,lbs/ft}^3}{156}\right)}{\text{Solid Bulk Density, lb/ft}^3}$$

4,884,926

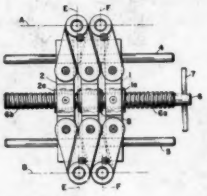
DOWELLING JIG

Jeremy H. Gibson, Eastlake, Ohio, assignor to Leichtung Inc., Warrensville Heights, Ohio

Continuation-in-part of Ser. No. 134,314, Dec. 14, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 302,183

Int. Cl.[4] B23B *49/00*

U.S. Cl. 408—115 R **9 Claims**



1. A dowelling jig comprising a primary clamping element and secondary clamping elements arranged for guided movement with respect to the primary element and each other, means to guide said elements, at least two sets of links arranged in pairs pivotally connected at their inner ends to the clamping elements and with the axes of the connections in alignment, and at their outer ends pivotally connected whereby the axes of such outer end connections will move along a line parallel with the axes of the inner ends, and the pairs of the other set being connected in the same manner at the inner and outer ends, and extending in an outward opposite direction to the

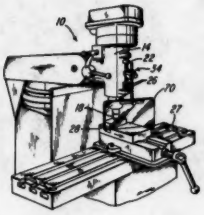
first described links, the outer ends of each set of links being formed to receive drill guide means, whereby drills operated in the guide means will form aligned holes in workpieces clamped by the clamping elements.

4,884,927

SHIELD UNIT FOR MACHINE TOOL

Robert L. Menker, 2560 Celina Rd., St. Marys, Ohio 45885

Filed Sep. 29, 1988, Ser. No. 250,540
Int. Cl.[4] B23C *9/00*; B23Q *11/08*
U.S. Cl. 409—134 **14 Claims**



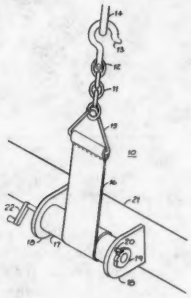
1. A shield unit for attachment to a machine tool which is provided with a cutting member in which an operator of the machine tool is positioned adjacent the cutting member as the cutting member cuts a work piece, the machine tool also being provided with a threaded rod, comprising an elongate stem, a clamp, the clamp having movable clamp portions, each clamp portion having a threaded part, means attaching the clamp to the stem, a rigid transparent sheet, and means attaching the rigid transparent sheet to the stem, whereby the threaded parts of the movable clamp portions of the clamp are clampingly attached to the threaded rod, and the rigid transparent sheet is positioned adjacent the cutting member and between the cutting member and an operator of the machine tool as the rigid transparent sheet serves as a shield to protect the operator of the machine tool.

4,884,928

BELT BINDER FOR CARGO BINDER CHAINS

Ronnie Nachtigall, P.O. Box 756, Eagle, Id. 83616, and Frank N. Fisher, 2831 N. 15th St., Meridian, Id. 83642

Continuation of Ser. No. 106,392, Oct. 9, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,867
Int. Cl.[4] B61D *45/00*; B65D *63/00*
U.S. Cl. 410—103 **1 Claim**



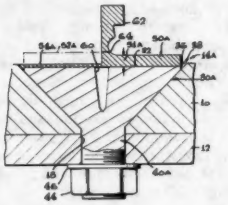
1. A belt binder means for securing and for tensioning cargo chains around the cargo of a cargo trailer which cargo trailer requires cargo chains, the binder means comprising a pair of end plates secured to the cargo trailer; a spindle means rotatably attached between said end plates and having a slot disposed therein parallel to the axis of rotation; said spindle means having a ratchet wheel coaxially secured to said spindle means, the wheel having a sufficient number of teeth to facilitate small adjustments; and a pawl means pivotally attached to one of said pair of end plates and engaged with the teeth of said ratchet wheel; a binder strap being constructed of a strong, flexible fiber webbing and having a first end inserted in the slot of said spindle means; a "D" or "v" ring attached to a second end of said binder strap; a segment of cargo chain having a first end attached to said "d" or "V" ring; and a hook attached to a second end of said cargo chain segment for detachably engaging the cargo chain disposed around the cargo, said belt binder means providing ready access by placement remote from the top of the load to allow retensioning of the chains even after the cargo has been tarped, if a tarp is used; said binder means providing a limited elastic strength accommodating some load shifting to thus reduce the accidental release of tensional forces by road vibrations or the like.

4,884,929

FLUSH HEAD FASTENER

Charles R. Smith, Toluca Lake; Anthony E. Brindisi, Riverside, and Gerald W. Tyree, Sun Valley, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Dec. 21, 1987, Ser. No. 135,852
Int. Cl.[4] F16B *19/00, 31/00, 33/00*
U.S. Cl. 411—3 **12 Claims**



1. A flush head fastener, the fastener for joining two or more structural elements together, the structural elements having a fastener hole therein with a recess for receiving the head of the fastener in communication with one surface of the structural elements, the fastener comprising:

a shank;

a head joined to said shank; and

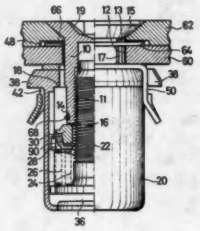
a layer of non-resilient material permanently joined to and generally covering the entire top surface of said head of the fastener, said layer of material readily reconfigurable relative to said head and the structural elements;

such that upon installation of the fastener in the hole said layer of material can be reshaped by deformation filling any gap between said head, said layer of material of the fastener and the recessed end of the hole, and the excess material above that needed to blend said layer of material into substantial conformity with the one surface of the structural elements can be readily removed.

4,884,930
PANEL FASTENER WITH FRICTION CONES

Peter Döbbeler, Kelkheim, Fed. Rep. of Germany, assignor to Camloc GmbH, Kelkheim, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 241,006
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1987, 3729422
Int. Cl.[4] F16B *31/00, 39/00*
U.S. Cl. 411—6 7 Claims



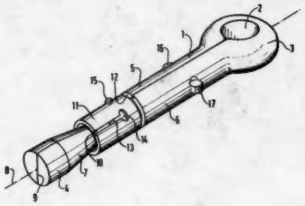
1. Fastener apparatus for joining together two plates having aligned openings, comprising:
an internally threaded pin adapted to be guided through aligned openings in the plates;
a generally cup-shaped accommodating element;
a threaded bolt mounted centrally within the accommodating element, for threadedly receiving the pin;
spring means located within the accommodating element and yieldably resisting entry of the pin therein; and
securing means located within the accommodating element for preventing an unintended loosening of the pin from the bolt, the securing means including two locking washers accommodated on the threaded bolt and engaging each other when the pin is threaded onto the bolt, wherein the locking washer that faces the pin is rotatably guided and axially displaceable up to an external stop of the accommodating element, and wherein the locking washer that faces away from the pin is prevented from rotating, but guided in displaceable fashion in the accommodating element against the yielding resistance of the spring means, such that the locking washer that faces the pin, under action of a torque applied by the pin that exceeds a certain value, is rotatable relative to the locking washer that faces away from the pin and the pin is threaded onto the bolt to a tightened position, and wherein the locking washers have conforming, frusto-conical frictional surfaces that engage each other under adhering friction while the pin is threaded fully onto the bolt and that engage with each other with a lesser, sliding friction while the pin is rotating relative to the bolt, and wherein the cone angle of the conforming, frusto-conical surfaces of the locking washers is substantially self-restraining.

4,884,931
SUSPENSION PEG

Gérard Revol; Maxime Roillet, both of Chabeuil, and Jean-Paul Barthomeuf, Bourg de Peage, all of France, assignors to Societe de Prospection et d'Invention Techniques, S. A., Bourg les Valence, France

Filed Feb. 25, 1988, Ser. No. 160,544
Claims priority, application France, Feb. 25, 1987, 8702484; Nov. 10, 1987, 8715537
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—57 20 Claims

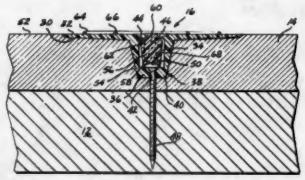
1. A suspension peg to be anchored within a hole defined within a support panel and from which objects may be suspendingly supported, comprising:
a wire bent upon itself so as to form a substantially annular securing eye portion, to which said objects to be suspendingly supported may be secured, at one end of said suspension peg; mating wire ends, to be anchored within said hole defined within said support panel, formed at the opposite end of said suspension peg; and an intermediate portion of said suspension peg defined between said annulara securing eye portion formed at said one end of said suspension peg and said mating wire ends formed at said opposite end of said suspension peg; and
expansible collar means, having a predetermined inner diametrical extent, disposed about said intermediate portion of said suspension peg for engagement with interior wall prtions of said hole defined within said support panel when said expansible collar means is radially expanded so as to anchor said suspension peg within said hole defined within said support panel,
said mating wire ends of said suspension peg wire including expansion means, having an outer diametrical extent which is greater than said inner diametrical extent of said expansible collar means, for operatively engaging said expansible collar means, under the influence of a tractive force exerted upon said securing eye portion in a direction extending outwardly from said hole from said mating wire ends of said wire toward said securing eye portion of said wire, and for radially expanding said expansion collar into said anchoring engagement with said interior wall portions of said hole defined within said support panel.



4,884,932
DECKING INSULATION FASTENER

Eugene M. Meyer, 204 Mountain Park, Apt. C102, Issaquah, Wash. 98027

Filed May 1, 1987, Ser. No. 44,708
Int. Cl.[4] F16B *43/00*; E04B *5/00*
U.S. Cl. 411—373 15 Claims



1. A fastener system comprising:
a generally flat plate having an upper surface and a lower surface, a central hub portion extending downwardly from the lower surface thereof, the hub portion including a central elongate cavity having a first opening disposed at the downwardly extending end of the hub portion distal from the lower surface, the first opening being adapted to accommodate a shank of a fastener driven therethrough, an opposite end of the cavity including a second opening disposed in the plate and larger than the first opening;
an elongate solid plug having a projecting driving head allowing the plug to be forcibly driven into the cavity through the second opening, into abutment with the fas-

tener, a shoulder on the plug being below the upper surface of the plate; and

means comprising a resilient lip for retaining the plug in the cavity and sealingly engaging the driving head, preventing the fastener from backing out of the first opening.

4,884,933

ADAPTOR FOR SCREWHEADS AND THE LIKE

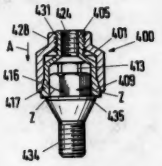
Rosel Preusker, and Werner Preusker, both of Atzelgift, Fed. Rep. of Germany, assignors to Confon AG, Rheineck, Switzerland

Division of Ser. No. 905,859, Sep. 10, 1986. This application Sep. 21, 1987, Ser. No. 99,073

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 8526164[U]; Oct. 19, 1985, 8529687[U]; Oct. 29, 1985, 8530606[U]; Aug. 29, 1986, 8623171[U]

Int. Cl.[4] F16B *37/04*

U.S. Cl. 411—177 **14 Claims**



1. An adaptor for bolts, nuts or rim screw heads for mounting a fixing disk of an anti-skid device, particularly for vehicle wheels carrying pneumatic tires when driven on ice and snow, said anti-skid device having a fixing disk attachable to the wheel rim and provided with openings for attaching to rim screws or wheel studs, and a supporting disk held and lockable on the fixing disk by means of a retaining ring and having a plurality of equidistant radially directed anti-skid arms formed in a prebent profile from plastic or some other suitable material engaging over the tire tread and provided externally and internally on their free ends with a gripping profile, while having spikes or metal bodies on the outside, wherein the adaptor engaging over the head of a bolt, nut or rim screw comprises a cap-shaped outer part and a cap-shaped inner part, the outer part having fixed grippers for engaging over the inner part, the inner part being provided with a wall, for the formation of holding sections, with longitudinal slots and shape grippers and one of said outer part and said inner part having a tapped hole longitudinally formed therein, whereby, by screwing or pressing the outer part over the inner part in the longitudinal direction of the bolt, rim or rim screw, the shape grippers are pressed against a bolt, nut or rim screw head, for forming a durable, secure connection between the adaptor and the bolt, nut or rim screw head, the connection being detachable and reusable and, by means of the adaptor, different parts can be connected to the bolt, nut, or rim screw head by means of a screw engaging the tapped hole, the outer part of the adaptor having an all-around edge and being provided, on an inner wall side adjacent to said all-around edge, with a first wall surface tapering conically towards the edge, and the inner part has a lower all-around edge and is provided, adjacent to said lower all-around edge on an outer wall side, with a second wall surface conically widening towards the edge, whereby, when the outer and inner parts are joined together, the first conical wall surface presses against the second conical wall surface.

4,884,934

JUNCTION BOLT WITH ADJUSTABLE CLAMPING FORCE

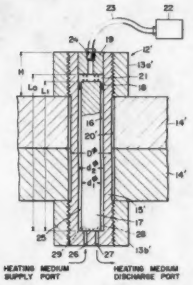
Takashi Ikeda, and Euji Tsunoda, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 25, 1987, Ser. No. 101,030

Claims priority, application Japan, Oct. 1, 1986, 61-233989

Int. Cl.[4] F16B *35/02*

U.S. Cl. 411—383 **21 Claims**



1. A junction bolt adapted to clamp members to be joined together by the use of clamping nuts, said junction bolt comprising:

(a) a bolt body provided with an inner axial hollow hole having a first open end and a second end;

(b) a piston member coaxially located in said inner axial hollow hole with a space between the outer peripheral surface of said piston member and an inner wall of said bolt body defining said inner axial hollow hole;

(c) a plug means adapted to close said first, open end of said inner axial hollow hole;

(d) a sealing means located on the outer peripheral surface of said piston member to separate said space into a first space as a pressurizing space into which, in use, a pressurizing fluid is introduced and a second space as a temperature adjusting space into which, in use, a heat medium is introduced;

(e) means for introducing a pressurized fluid into said first space; and

(f) means for introducing a heat medium into said second space, said means for introducing a heat medium into said second space comprising a port provided in said second end of said inner axial hollow hole.

4,884,935

COLLAPSIBLE TRANSPORTER MODULE AND METHOD OF USING SAME

Garry D. F. Smith, Orangeville, and William Manderson, Ontario, both of Canada, assignors to Xerox Canada, Inc. and Associated Management Group, both of Mississauga, Canada

Filed May 6, 1986, Ser. No. 860,369

Int. Cl.[4] A47F *5/08*

U.S. Cl. 414—498 **1 Claim**

1. A collapsible transporter module for transporting goods in a transporter vehicle or container having at least one overhead rail, said module comprising:

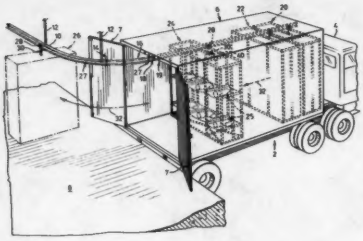
means for slidably suspending said module from said overhead rail;

an upper rigid frame suspended from said mounting means having two end members and four evenly spaced apart cross members attached to said end members, the outermost cross members at either end joining the ends of said end members to form a rectangle;

three vertically elongate collapsible end support members suspended from each of said outermost cross members,

said end support members having a plurality of female attachment members attached thereto;

three vertically elongate collapsible middle support members suspended from each of said other two cross members, said middle support members having a plurality of female attachment members opening on two sides of said middle support member, said middle support member having flaps overhanging each of said openings for each of said female attachment members;



a lower rigid frame attached to the other end of said middle and end support members;

a plurality of flexible shelf members having two reinforced side edges, a front edge and a back edge, and a padded flap hanging from at least one of said front or back edges;

said reinforced side edges having male attachment means for adjustable attaching said shelf members to said middle and end support members; and

a securing means for storing said module in a collapsed mode when said module not being used for transporting goods.

4,884,936

LIFT FOR MOVING A CONTAINER WITH CASTORS

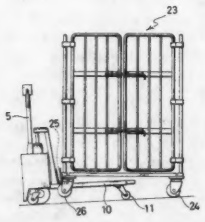
Hiroyuki Kawada, Hekinan, Japan, assignor to Sugiyasu Industries Co., Ltd., Takahama, Japan

Filed Jul. 13, 1988, Ser. No. 218,622

Claims priority, application Japan, Mar. 20, 1988, 63-36506[U]

Int. Cl.[4] B60P *1/64*

U.S. Cl. 414—498 **2 Claims**



1. A vehicle for carrying a container from one place to another, the container having a first end and a second end with casters for supporting at least the second end thereof, said vehicle comprising

(a) a mobile body with wheels resting on the ground and with means for driving said wheels to move the mobile body,

(b) a carrier projecting forward from the mobile body and supported at a front portion thereof by wheels resting on the ground,

(c) means provided in the mobile body for moving the carrier between a lower position where the carrier does not support the container and an upper position where the carrier supports the container at a first end thereof so that said first end of the container are lifted off of the ground while the caster at said second end thereof is allowed to rest on the ground,

(d) a support member provided on the carrier for directly receiving and supporting said first end of the container when the carrier is in said upper position, said support member being located between the mobile body and a middle of the length of the carrier an d having an upright back portion, a bottom portion extending forwardly and horizontally from the bottom of said back portion and a forwardly inclined front portion extending upwardly from the forward edge of said bottom portion and spaced apart from said back portion and having a smaller height than said back portion, said front and back portions defining therebetween a space for receiving said first end of the container, and

(e) a mounting plate removably attached to said carrier, said mounting plate having resilient means for connecting the lower end of said back portion of said support member to the mounting plate in such a manner as to normally urge the support member to a first position where the back portion thereof stands upright, but allow the support member to incline to a second position where an upper portion of the back portion thereof is nearer to the mobile body when said first end of the container abuts on the back portion thereof.

4,884,937

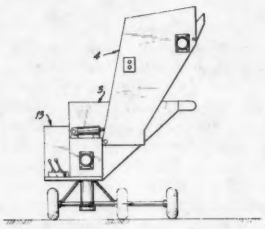
LEAF COLLECTION AND REMOVAL APPARATUS

John P. Braunius, 12 Short St., Midland Park, N.J. 07432

Filed Jul. 16, 1987, Ser. No. 74,153

Int. Cl.[4] B60P *1/36*

U.S. Cl. 414—505 **2 Claims**



1. A leaf collection and removal vehicle adapted to transfer leaves from the ground to a leaf collection comparatment above the ground of a second vehicle to which said leaf collection vehicle is adapted to be attached comprising:

a vehicle having a frame, a front inlet end, a means for moving and transporting leaves to the refuse collecting compartment;

a chute means movably mounted on said frame, said chute means having an independent, extendable wheel base for transporting said chute in a path perpendicular to the wheels of a second vehicle when said chute means is detached from said frame said chute means having an inlet into which leaves enter said chute and an outlet communicating with said leaf collection compartment;

said inlet having guard means, said guard means comprising a plurality of vertically disposed, spaced apart, relatively thin bar members adapted to prevent large objects from entering said inlet;

means for moving said frame to and from a position wherein said inlet is in substantial abutment with the underlying ground whereby said inlet end is positioned so as to be adapted to receive leaves resting on the ground;

a rotatable drum extending transversely across said inlet end

and connected to said chute, said rotatable drum having helical coil springs to flex and conform to the leaves entering said inlet, said helical coil springs being affixed to the outer surface of said rotatable drum comprising a plurality of rows of spring-like extensions capable of flexing under said drum as leaves are urged and carried from said inlet, said coil springs having a pointed end portion and a coiled body portion;

means for rotating said drum whereby the leaves will be urged into said inlet;

conveyor means on said frame within said chute having a first end and a second end, said first end being adjacent to said inlet and being positioned to receive leaves from said drum;

said conveyor means comprising an endless belt within said chute for receiving leaves from said rotatable drum adjacent to said inlet, said belt having a leaf conveying surface which includes a plurality of spaced apart ribs adapted to hold the leaves in position on said conveyor surface until the conveyor means reaches the second end; and

a hood having auger means connected therewith adjacent said second position, said auger being adapted to move the leaves exiting said conveyor means to said refuse collecting compartment.

4,884,938

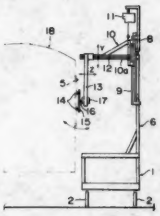
APPARATUS FOR HANDLING LARGE-SIZED ARTICLES

Yoshitada Fujita, Kobe; Sadashi Hanada, Miki, and Yoshiaki Yamamoto, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 936,961, Dec. 1, 1986, abandoned, which is a continuation of Ser. No. 714,219, Mar. 21, 1985, abandoned. This application Oct. 12, 1988, Ser. No. 256,467

Int. Cl.[4] B66F *11/00*; B66C *23/00*

U.S. Cl. 414—541 **7 Claims**



1. An apparatus for handling a large-sized article comprising:

a mobile truck;

a support structure which is mounted on said mobile truck;

a traversing device which is movably mounted on said support structure for lateral movement;

a lifting device which is movably mounted on said traversing device for vertical movement independently of the lateral movement;

a carriage movably mounted on said lifting device for fore and aft movement independently of the lateral and vertical movements;

a bracket having suction cups mounted thereon;

a universal joint which is secured to said bracket; and

a fixing device to which said bracket is rotatably connected by said universal joint for fixing and releasing the rotation of said bracket with respect to said fixing device, said fixing device being pivotably mounted on said carriage so as to be able to rotate between a first position in which said suction cups on said bracket can be brought into contact with an object of said mobile truck and a second position in which said bracket is substantially parallel to a desired position to which the object is to be moved.

4,884,939

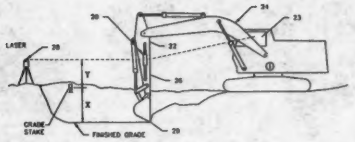
SELF-CONTAINED LASER-ACTIVATED DEPTH SENSOR FOR EXCAVATOR

Edward G. Nielsen, Grand Rapids, Mich., assignor to Laser Alignment, Inc., Grand Rapids, Mich.

Filed Dec. 28, 1987, Ser. No. 138,301

Int. Cl.[4] E02F *5/02*

U.S. Cl. 414—698 **18 Claims**



1. In an excavator apparatus including a stick controllable by an operator located in an operator compartment spaced a distance from said stick, said stick being capable of movement to a vertical orientation and to different inclined orientations; a cutting edge connected to said stick and; a depth sensor mounted to said stick; the improvement comprising:

said depth sensor comprising a self-contained laser actuated sensor including housing means having exterior wall means, said housing means including an electronic assembly for determining depth of said cutting edge and inclination of said stick;

said electronic assembly including a plurality of light responsive cells exposed on at least one side of said housing means on and responsive to contact with a laser beam to provide a first signal;

said electronic assembly further including first indicator means and a first lighted visual indicator; said indicator means located in said housing and responsive to said first signal when a laser beam contacts said cell for displaying on said first lighted visual indicator a first lighted visual indication to the operator indicative of the depth of said cutting edge, said first lighted visual indicator being located and exposed on one side of said housing means so as to face said operator compartment;

said electronic assembly also including inclination sensing means within said wall means responsive to the orientation of said housing means for producing a second signal when the housing means is substantially at a predetermined relationship to said earth's vertical and for producing one of a third and fourth signal when said housing means is not substantially at said relationship;

said electronic assembly including second indicator means including second, third and fourth lighted visual indicators exposed on the same one side of said housing means as said first lighted visual indicator, said second indicator means responsive to said inclination sensing means for displaying on said second lighted visual indicator a second lighted visual indication when said second signal is present and for displaying on one of said third and fourth lighted visual indicators one of a third and fourth lighted visual indication when one of said third and fourth signals is present, respectively;

said second indicator means displaying at any one time one of said second, third or fourth lighted visual indications; and

said first, second, third and fourth lighted visual indicators being sufficiently large and intense to be visible and observable from the operator compartment whereby, with said housing means mounted to the stick and said first, second, third and fourth lighted visual indicators facing the operator compartment, the excavator operator can

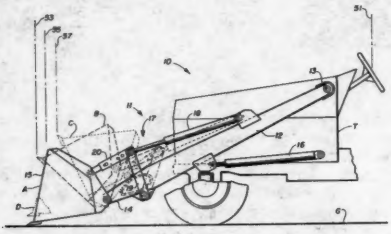
view said lighted visual indicators from said operator compartment and adjust the position of the stick while simultaneously looking at it and the work area and observing which of said second, third or fourth signals are being displayed by the lighted visual indicators of said second indicator means.

4,884,940

LOADER BUCKET TRANSPORT LINK

John O. Steinkamp, Milford, Mich.; Garry L. Ball, Lancaster, Pa., and Daniel D. Radke, Troy, Mich., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Mar. 10, 1989, Ser. No. 322,026
Int. Cl.[4] E02F *3/80*
U.S. Cl. 414—715 **12 Claims**



1. In a bucket loader mountable on a tractor to extend forwardly of said tractor for operation, said bucket loader having a bucket positioned forwardly of said tractor and a longitudinally extending mounting frame including a pair of transversely spaced support arms pivotally connected at a first end to said tractor and pivotally supporting said bucket from a remote second end, said mounting frame further including a control linkage interconnecting said support arms and said bucket to control the pivotal movement of said bucket about said second end of said support arms, said control linkage including a selectively extensible hydraulic cylinder fastened to one of said support arms and a connecting link interconnecting said hydraulic cylinder and said bucket at a position remote from said second end of said support arms, an improved connecting link comprising:

a first member pivotally connected to said hydraulic cylinder;

a second member telescopically associated with said first member and being pivotally connected to said bucket; and

limit means interconnecting said first and second members to restrict the telescopic movement therebetween.

4,884,941

ACTIVE COMPLIANT END-EFFECTOR WITH FORCE, ANGULAR POSITION, AND ANGULAR VELOCITY SENSING

Homayoon Kazerooni, Minneapolis, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Mar. 30, 1987, Ser. No. 31,769
Int. Cl.[4] B66C *1/10*
U.S. Cl. 414—744.5 **15 Claims**

1. An end-effector for use with a robotic manipulator, comprising:

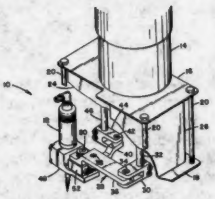
a linkage including an output link, a first drive link and a connecting link each coupled at one end in a spaced-apart relationship to the output link, and a second drive link coupled at one end to the other end of the connecting link;

means for mounting a tool on the output link of said linkage;

first rotary drive means coupled to the other end of the first drive link of said linkage for applying torque thereto and for generating signals representative of its angular displacement and angular velocity;

second rotary drive means coupled to the other end of the second drive link of said linkage for applying torque thereto and for generating signals representative of its angular displacement and angular velocity; and

sensor means connected between said tool mounting means and the output link of said linkage for generating signals representative of forces in orthogonal directions parallel to the plane of the output link of said linkage upon interaction of the tool with a workpiece;



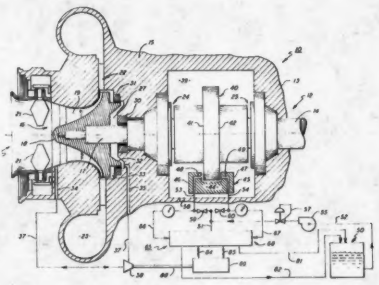
said first and second rotary drive means each being responsive to said angular displacement, angular velocity and force signals for applying controlled torque to said linkage in order to achieve active electronic compliancy between the tool and manipulator upon interaction with the workpiece.

4,884,942

THRUST MONITORING AND BALANCING APPARATUS

Hans Pennink, deceased, late of Clinton Park, N.Y. (by Liv Pennink, executrix), assignor to Atlas Copco Aktiebolag, Sweden

Continuation-in-part of Ser. No. 879,970, Jun. 30, 1986, abandoned. This application Dec. 16, 1988, Ser. No. 285,710
Int. Cl.[4] F01D *3/04*
U.S. Cl. 415—104 **14 Claims**



1. Control apparatus for use in a rotating machine of the type having a balancing chamber containing a pressurized fluid that acts against a rotor assembly and an adjustable control valve for increasing or decreasing the pressure in said chamber, said apparatus including

a first delivery line having a discharge nozzle for directing a first fluid stream axially against one surface on the rotor assembly,

a second delivery line having a discharge nozzle for directing a second fluid stream axially in a direction opposite said first stream against another surface of said rotor assembly,

sensing means for detecting the difference in pressure in the first and second delivery lines behind each nozzle

adjusting means that is responsive to said sensing means for positioning the adjustable control valve to automatically

maintain said difference in pressure at a given value at which the axial forces acting on the rotor assembly are balanced.

4,884,943

METHOD AND APPARATUS FOR PUMPING HIGH-CONSISTENCY FIBER SUSPENSION

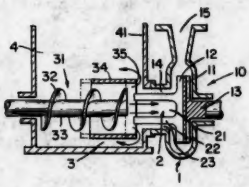
Toivo Niskanen, Hamina, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Jun. 21, 1988, Ser. No. 209,634

Claims priority, application Finland, Jun. 25, 1987, 872817; Jul. 6, 1987, 872968

Int. Cl.[4] F04D 1/10

U.S. Cl. 415—143 **10 Claims**



4. An apparatus for pumping high-consistency fiber suspension comprising a centrifugal pump located within a housing having an inlet and an outlet, an impeller rotatably mounted within said housing, a fluidizing rotor located upstream from said impeller within said inlet, feed means for feeding fiber suspension to said rotor in said inlet, said inlet having an entrance for receiving the fiber suspension from said feed means, means located in the flow path of the fiber suspension from said feed means to the entrance of said inlet for withdrawing the fiber suspension, and returning at least a portion of the fiber suspension to said feed means.

4,884,944

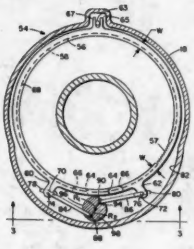
COMPRESSOR FLOW FENCE

David L. Tate, Stratford, Conn., assignor to Avco Corporation, Providence, R.I.

Filed Sep. 7, 1988, Ser. No. 241,417

Int. Cl.[4] F04D 27/02

U.S. Cl. 415—156 **12 Claims**



1. A flow control system for the annular inlet housing of a compressor, said system comprising:

at least one split ring received in a circumferential recess in said housing, said ring having adjacent free ends, a circular reference diameter, and an internal circumference which is serrated; and

means connected between said housing and actuation points adjacent each of the free ends of said ring for displacing said free ends toward and away from one another through a predetermined path thereby varying the reference diameter of said ring; and bringing said serrated internal circumference into and out of the flow path of said inlet housing.

4,884,945

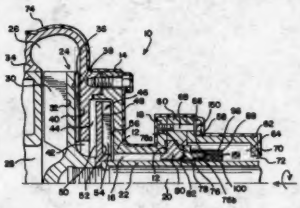
DYNAMIC SEAL ARRANGEMENT FOR IMPELLER PUMP

Allan J. Boutin, Boonville, Ind., and Daniel D. Ocheda, Schiller Park, Ill., assignors to John Crane, Inc., Moreon Grove, Ill.

Filed Jul. 21, 1988, Ser. No. 222,196

Int. Cl.[4] F04D 29/14

U.S. Cl. 415—174.2 **8 Claims**



1. In a pump including a rotatable shaft, an impeller on said shaft to pressurize fluid during rotation of said shaft, a pump housing defining a seal cavity surrounding the shaft, means sealing said shaft and housing against fluid leakage therebetween during said pumping operation and when said shaft is not rotating said means comprising, in combination, an expeller rotatable with said shaft to evacuate fluid from the seal cavity during pump operation, thereby eliminating the need for a fluid tight seal between said housing and said shaft during said pumping operation, a dynamic seal arrangement for providing a seal between said pump housing and said shaft when said shaft is not rotating, said seal arrangement comprising:

(a) an axially movable primary seal ring adapted to be disposed annularly about said shaft and secured in fluid tight relation to one of said shaft and said housing, said primary seal ring defining a radial seal face;

(b) a stationary mating seal ring adapted to be disposed annularly about said shaft and secured in fluid tight relation to the other of said shaft and said housing, said mating seal ring defining a radial seal face adapted for sealing contact with said radial seal face of said primary seal ring;

wherein one of said radial faces of one said seal ring defines a smooth surface and the radial seal face of said other seal ring defines a surface having a plurality of spiral grooves therein, said faces being exposed to the fluid within the pump at one circumferential periphery and to the atmosphere external to the pump at the opposite circumferential periphery, said grooves extending from said circumferential periphery exposed to atmosphere external to the pump radially partially toward the other circumferential periphery thereof and terminating to define on said surface of said radial face, between said grooves and said circumferential periphery, exposed to atmosphere external to the pump a sealing dam adapted to sealingly engage said smooth radial face of said other of said seal rings;

biasing means urging said axially movable ring toward said stationary mating seal ring to cause said dam to engage said radial face of said other ring when said pump shaft is not rotating;

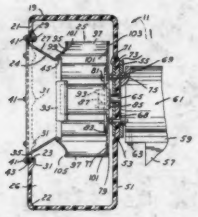
said grooves pumping atmosphere between said faces when said pump shaft is rotating at operational speed at a pressure to separate said radial faces of said seal rings.

4,884,946

BLOWER HOUSING CONSTRUCTION

James A. Belanger, Northville; Robert J. Wentworth, Northville; Barry S. Turner, Livonia, and Graham J. Astley, Novi, all of Mich., assignors to Belanger, Inc., Northville, Mich.

Division of Ser. No. 45,331, May 4, 1987, Pat. No. 4,799,281.
This application Oct. 31, 1988, Ser. No. 264,723
The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.
Int. Cl.[4] F04D *29/42*
U.S. Cl. 415—206 5 Claims



1. A unit blower housing of molded plastic material having a generally circular outer wall and laterally spaced front and rear walls defining an impeller chamber of generally rectangular cross-section:

said housing terminating in an elongated tangential outlet arranged upon a first axis adapted to receive a hose;

one of said front and rear walls adapted to have a circular opening cut therein upon a second axis at right angles to said first axis adapted to receive and mount an air inlet cone; and

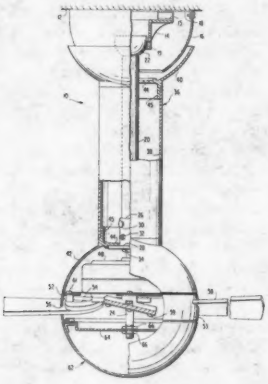
a plurality of spaced threaded insert fasteners molded into, interlocked and non-rotatively enclosed within said one wall, arranged in a circle radially outward of said opening.

4,884,947

CEILING FAN ASSEMBLY

Ron Rezek, Los Angeles, Calif., assignor to Beverly Hills Trading Company, Inc., North Hollywood, Calif.

Filed Sep. 27, 1988, Ser. No. 250,257
Int. Cl.[4] F04D *29/64*
U.S. Cl. 416—5 7 Claims



1. A ceiling fan assembly comprising:

(a) a ceiling fixture attachable to a ceiling structure;

(b) a shaft having one end shaped to hang vertically from the ceiling fixture;

(c) a support hub attached to the other end of the hollow shaft;

(d) a column assembly supported from the hub and including an elongated vertical hollow column surrounding and spaced from the shaft, and further including a partly spherically shaped canopy at a lower end thereof;

(e) an electric fan drive motor carried by the lower end of the shaft, the motor having a drive rotor;

(f) a fan blade support structure positioned below said canopy, the fan blade support structure including a partly spherical blade support housing having spaced fan blade mounting slots therein, the support structure including means for attaching the support structure to the motor rotor and means for attaching fan blades to said support structure;

(g) a plurality of fan blades having attachment means on the inner end of each blade for attachment to blade support structure;

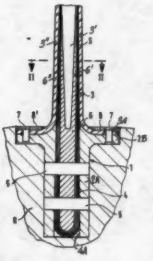
(h) a partly spherical bottom cover assembly positioned below the fan blade support structure for at lease partially covering the bottom of the motor while being spaced therefrom, the bottom cover supported from the bottom of the shaft the combination of said canopy, said fan blade support housing and said bottom cover assembly surrounding said drive motor and providing the appearance of a ball.

4,884,948

DEFLECTABLE BLADE ASSEMBLY FOR A PROP-JET ENGINE AND ASSOCIATED METHOD

Siegfried Sikorski, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 29, 1988, Ser. No. 174,781
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710321
Int. Cl.[4] F01D *5/30*
U.S. Cl. 416—132 R 22 Claims



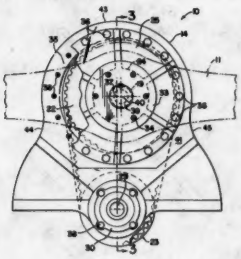
1. A deflectable blade assembly for a prop-jet engine comprising a metallic pin mountable in a rotor and including a shank and an enlarged head on said shank, a hollow shell member secured to said head and projecting from the rotor, said shell member having an outer surface forming an aerodynamic blade profile, a first spar of fiber material fixed to said pin, said first spar projecting from said pin and being incorporated into said hollow shell member to supportably engage said shell member to permit said shell member to undergo elastic deformation upon application of lateral force thereto with bending of said shell member and said first spar, said spar defining a hollow interior, a second spar of metal fitted within the hollow interior of said first spar, and means securing said second spar to said pin.

4,884,949

DRIVE UNITS FOR AIR DRIVEN VEHICLES

Robert R. Eakin, R.D.#2, Box 262, Franklin, Pa. 16323

Continuation-in-part of Ser. No. 73,743, Sep. 10, 1979, abandoned. This application Jun. 15, 1981, Ser. No. 273,596
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.
Int. Cl.[4] F01D *25/24*
U.S. Cl. 416—170 R 6 Claims



1. A transmission for connecting a propeller (11) to an engine (12) having a crankshaft (13),

a frame (14),

said frame (14) having a front (41), a back (42), sides (43,44), and a top (45),

said frame being generally half cylindrical in shape,

said front (41), said back (42), said sides (43,44) and said top (45) being integrally connected together forming a single piece of material,

first attaching means (15) attaching said frame (14) to said engine (12),

a propeller shaft (19),

said front (41) having an opening,

propeller shaft bearing means (20) extending through said opening and having a center line (40),

and second attaching means (36) attaching said propeller shaft bearing means (20) to said front (41) of said frame (14) adjacent said half cylindrical top (45),

drive pulley means (21),

a crank shaft (17),

third attaching means attaching said crank shaft (17) to said drive pulley means (21),

driven pulley means (22) on said propeller shaft (19),

said opening in said front of said frame being larger than said driven pulley means (22) thereby permitting said driven pulley means (22) to pass therethrough,

said propeller shaft bearing means (20) has a support having a radially outwardly directed circular flange (25),

said circular flange having substantially the same radius of curvature as said half cylindrical top (45),

said second attaching means (36) removably attaching the outer periphery of said circular flange (25) to said frame (14) around the outer periphery of said opening whereby said driven pulley means can be removed from said frame through said opening, and the shape of said frame adds strength to said frame to support said bearing means (20),

and belt means (23) connecting said drive pulley means (21) to said driven pulley means (22),

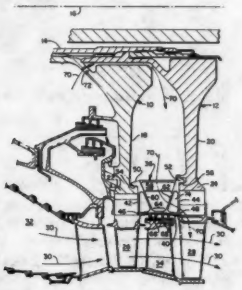
and bearing means fixed to said frame supporting an end of said crank shaft (17) remote from said crankshaft on said frame.

4,884,950

SEGMENTED INTERSTAGE SEAL ASSEMBLY

Robert F. Brodell, Marlborough, and Gabriel L. Sucin, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 6, 1988, Ser. No. 241,290
Int. Cl.[4] F01D *5/06*
U.S. Cl. 416—174 6 Claims



1. Means for providing a gas-tight seal between a first rotor and a co-rotating second rotor in an axial flow turbomachine, comprising:

a plurality of seal segments, disposed between a disk portion of the first rotor and a disk portion of the second rotor, the plurality of segments collectively forming an annular seal assembly extending axially between the first and second rotor disk and rotating therewith, each segment further including

a radially outer, gas-tight wall, extending circumferentially into sealing engagement with the radially outer, gas-tight walls of the two adjacent seal segments, further extending axially between the first rotor disk and the second rotor disk and being sealingly engaged therewith, the radially outer, gas-tight walls of the plurality of segments collectively defining a gas-tight annular barrier between the first and second rotor disks;

wherein the seal segments each further include,

first means, engaged with the first rotor disk for radially supporting the seal segment,

second means, engaged with the second rotor disk for radially supporting the seal segment, and

means, including a truss member, extending between the first supporting means and an axially cental portion of the radially outer wall of the segment for radially supporting the segment outer wall.

4,884,951

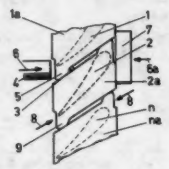
METHOD OF CLAMPING BLADES

Pierre Meylan, Neuenhof, and Peter Novacek, Gebenstorf, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Dec. 12, 1988, Ser. No. 283,144
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802741
Int. Cl.[4] F01D *5/22*
U.S. Cl. 416—191 5 Claims

1. Method of clamping blades of turbomachines in order to influence the blade vibrations occurring in such machines, the blades being each provided with a shroud plate, wherein the shroud plates (1*a*, 2*a*, na) are in contact with one another in the installed condition without clearance and without contact force, the shroud plates (1*a*, 2*a*, na) being plastically deformed

in the region of their boundaries by the force action (6, 6a, 8, 13, 13a) at one or more positions (5, 9, 10) in such a way that



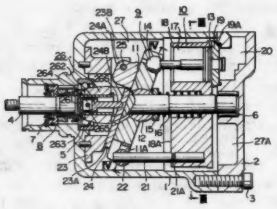
a prestressed connection occurs between the shroud plates (1a, 2a, na).

4,884,952

VARIABLE DISPLACEMENT COMPRESSOR

Hisanobu Kanamaru, Katsuta, and Kenichi Gunji, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering, Ltd., Katsuda, both of, Japan

Filed Sep. 16, 1988, Ser. No. 245,372
Claims priority, application Japan, Sep. 18, 1987, 62-232231
Int. Cl.[4] F04B 1/28
U.S. Cl. 417—222 8 Claims



1. In a variable displacement compressor comprising a rotary shaft journaled by a stationary part, a cylinder block arranged in a fixed relationship with said rotary shaft and formed with a plurality of through holes, pistons respectively received in said through holes and defining therein working fluid chambers, and piston means including a wobble plate arranged in opposition to said cylinder block and rotatably holding one end of said pistons, the compressor being constructed such that, when the cylinder block is rotated together with said rotary shaft, a fluid is sucked from a low pressure chamber into said working fluid chambers and is discharged therefrom into a high pressure chamber, the improvement comprising:

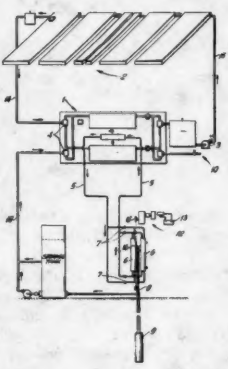
said wobble plate is supported on said rotary shaft for wobbling movement, said piston drive means further includes a pair of drive pins each having one end portion secured to said cylinder block and extending in parallel with said rotary shaft and the other end portions slidably engaging with said wobble plate through spherical bearings, a swash plate having an inclination surface making a sliding contact with a back surface of said wobble plate and supported by a swivel plate support member through a hinge mechanism at one part thereof for an inclination movement in an axial direction of said rotary shaft, said swash plate support member includes an annular spacer having one surface fixed to an inner surface of a casing and an opposite surface constituting an inclination surface, and operation means operably connected to said swash plate to move the latter for varying an inclination angle of said wobble plate, said operation means includes a piston mechanism adapted to be driven by a fluid pressure, said piston mechanism being embedded in said swash plate support member and engaging with said swash plate, said piston mechanism having a working chamber communicating with said high pressure chamber and including a piston means operated in accordance with a difference in pressure between said low pressure chamber and said high pressure chamber, and a spring for constantly biasing said piston means to closely contact said swash plate, and wherein said piston means has a smaller diameter end portion of spherical configuration which engages with a recess formed in said swash plate.

4,884,953

SOLAR POWERED PUMP WITH ELECTRICAL GENERATOR

Peter M. Golben, Florida, N.Y., assignor to Ergenics, Inc., Wyckoff, N.J.

Filed Oct. 31, 1988, Ser. No. 264,689
Int. Cl.[4] F04B 47/00
U.S. Cl. 417—379 1 Claim



1. a pumping apparatus comprising in combination:

a solar collector,

a heat exchange circuit including a circulating pump for moving a heat exchange fluid between the solar collector and a compressed gas engine for operation thereof,

the compressed gas engine provided with a hydriable metal and hydrogen arranged operatively in a sealed loop to drive a master piston,

a magnetic coupler for coupling the master piston to a slave well pump piston for conjoined motion therewith,

the well pump piston arranged operatively for pumping a liquid,

means for passing the liquid in noncontact heat exchange relationship with the hydriable metal for cooling thereof so that it can resorb hydrogen gas,

a rack connected to the well pump piston and connected to drive a pinion gear which in turn is connected to run a permanent magnet motor to charge a storage battery which in turn is connected to power the circulating pump.

4,884,954

TWIN COIL APPARATUS AND ENERGIZING STRUCTURE THEREFOR

Johannes W. Van Niekerk, 3 Bouer Street, Fichard Park, Bloemfontein, South Africa

Filed Jan. 25, 1982, Ser. No. 342,363
Claims priority, application South Africa, Jan. 30, 1981, 81/0626
Int. Cl.[4] F04B 17/04; H02K 33/00
U.S. Cl. 417—417 9 Claims

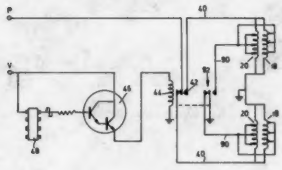
1. In an electrical device which comprises at least two solenoid means, plunger means mounted for relative reciprocating

movement between the solenoid means, a power supply means and control means for repeatedly and alternately energizing a plurality of the solenoid means with a direct current from said power supply means to produce an electromagnetic field which acts on the plunger means for causing reciprocating movement of the plunger means relative to the solenoid means,

wherein said solenoid means includes a former and a set of at least two coils wound on the former,

said coils of each of said sets being connected in parallel to each other for simultaneous excitation by said direct current, and

wherein the plunger means includes first and second cores, each core being located at least partially in one of the formers, the improvement comprising



connecting means in said control means for alternately connecting different sets of said coils to said power supply means and for discharging other sets of said coils in synchronism therewith, and

energizing means,

wherein said connecting means comprises relay means activated by said energizing means for repeated energization and de-energization and for operating a contact set to provide alternating connection of said power supply means to said sets of coils,

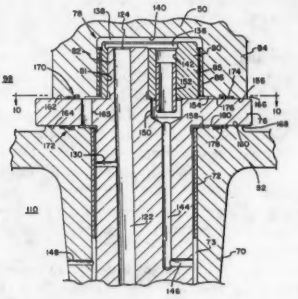
said energizing means comprising trigger means for providing a sequence of pulses to a controlled switch means connected between said power supply means and said relay means.

4,884,955

SCROLL COMPRESSOR HAVING OIL-ACTUATED COMPLIANCE MECHANISM

Hubert Richardson, Jr., Brooklyn, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed May 12, 1988, Ser. No. 193,416
Int. Cl.[4] F04C *18/04, 27/00, 29/02*
U.S. Cl. 418—1 **33 Claims**



1. A scroll compressor for compressing refrigerant fluid, comprising:

a fixed scroll member including an involute fixed wrap element;

an orbiting scroll member including a plate portion having a face surface and a back surface, said face surface having an involute orbiting wrap element thereon, said fixed and orbiting wrap elements being intermeshed to define at least one pocket of refrigerant fluid compressed by orbiting motion of said orbiting scroll member with respect to said fixed scroll member;

a thrust surface adjacent said orbiting scroll member back surface and spaced therefrom to define an axial gap therebetween;

a region of discharge pressure and a region of suction pressure, said regions of discharge and suction pressure establishing a pressure differential across said gap, said pressure differential initially causing flow of an actuating fluid within said gap;

seal means, actuable by said initial flow of actuating fluid, for establishing and sealingly separating said region of discharge pressure and said region of suction pressure within said gap, said seal means comprising a flexible annular seal element disposed within said gap, said seal element having a radially inner portion and a radially outer portion and being capable of flexing upon actuation of said seal means such that said radially inner and outer portions become axially offset; and

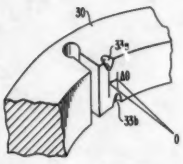
means in said gap for restraining said radially outer portion of said seal element against radially outward movement, whereby said seal element is permitted to flex.

4,884,956

ROTARY COMPRESSOR WITH CLEARANCE VOLUMES TO OFFSET PULSATIONS

Makoto Fujitani; Masashi Hirabayashi, both of Nagoya; Hideo Honda; Hiroshi Machida, both of Nishi Kasugai; Masami Kondo, and Sachio Onoda, both of Nagoya, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Churyo Engineering Kabushiki Kaishi, Aichi, both of, Japan

Filed Dec. 31, 1987, Ser. No. 140,237
Claims priority, application Japan, Jan. 20, 1987, 62-10681
Int. Cl.[4] F04C *18/356, 29/06*
U.S. Cl. 418—15 **7 Claims**



1. In a rotary compressor comprising a cylinder, a rotor rotatably mounted within said cylinder, a cylinder chamber defined between said cylinder and said rotor, a partition plate dividing said cylinder chamber into a suction side space and a compression side space, an inlet to said suction side space, a delivery port leading from said compression side space to a delivery valve, whereby during rotation of said rotor fluid is introduced through said inlet to said suction side space, compressed and delivered from said compression side space through said delivery port and said delivery valve, and a groove connected to said delivery port to ensure open passage from said compression side space to said delivery port, wherein said delivery port and said groove form a first clearance volume containing fluid at the end of a delivery stroke, such fluid in said first clearance volume flowing reversely into said suction side space at the beginning of a subsequent suction stroke and generating a first pulsation having a high frequency component, the improvement comprising means for reducing noise in said compressor due to said high frequency component of said first pulsation, said means comprising:

a second clearance volume displaced from said first clearance volume and provided at a position in communication

with said cylinder chamber to receive fluid therefrom at the end of the delivery stroke, such that the fluid within said second clearance volume flows reversely into said suction side space at the beginning of the subsequent suction stroke and thereby generates a second pulsation separate from said first pulsation and having a high frequency component in a manner to offset said high frequency component of said first pulsation, said second clearance volume being positioned at a location such that said second pulsation is phase-shifted by one-half cycle with respect to said high frequency component of said first pulsation.

4,884,957

DISPLACEMENT MACHINE HAVING DISPLACEMENT BODY AND SEALING MEMBERS ROTATING ON NON-PARALLEL AXES

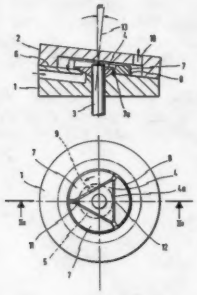
Wolfhart Wilimczik, Winterstrasse 11, 8037 Olching, Fed. Rep. of Germany

PCT No. PCT/EP86/00411, § 371 Date Mar. 7, 1988, § 102(e) Date Mar. 7, 1988, PCT Pub. No. WO88/00642, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 11, 1986, Ser. No. 177,659

Int. Cl.[4] F01C *3/06*; F04C *3/00*

U.S. Cl. 418—16 **20 Claims**



1. A displacement machine, comprising:

a casing having one end face provided with a hollow defining a working space;

an end plate closing said casing;

a displacement body accommodated in said casing and rotatable about a rotational axis, said displacement body having displacement surfaces engaging said hollow which extends concentric to said rotational axis of said displacement body and is arranged in said end face of said casing, said end face defining with said rotational axis of said displacement body an angle deviating from 90° so that said hollow has a cross sectional area which varies between a maximum value and a minimum value, said displacement body filling out and covering said hollow and having surface parts projecting into said hollow to define said displacement surfaces which are uniformly spaced about the circumference of said displacement body, with each of said displacement surfaces being defined by a section along an axis parallel area intersecting said hollow; and

sealing means bearing against said displacement surfaces so as to rotate therewith, said sealing means rotating on said end face of said casing about an axis inclined at a small angle relative to said rotational axis of said rotor and intersecting said axis thereby sealing said hollow.

4,884,958

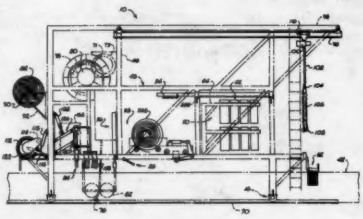
APPARATUS FOR SETTING UP AND POURING CONCRETE FORMS

William Lowndes, III; Francis V. Gay, II, and Benjamin A. Gay, all of Spartanburg, S.C., assignors to Lowndes Corporation, Spartanburg, S.C.

Filed Dec. 11, 1987, Ser. No. 131,653

Int. Cl.[4] B28B *17/00, 23/06*

U.S. Cl. 425—62 **54 Claims**



39. An apparatus for use in the forming of a concrete ember in an elongated concrete form having respective deck and stem portions, the apparatus comprising:

a frame structure positionable above the elongated concrete form;

support means provided on said frame structure for supporting said frame structure above the elongated concrete form for movement therealong;

motive means provided on said frame structure for moving said frame structure along the elongated concrete form on said support means;

means provided on said frame structure for dispensing a cover for the elongated form and for removing said cover therefrom;

means provided on said frame structure for installing and removing a bulkhead from the elongated concrete form;

deck cleaning means provided on said frame structure for cleaning a deck portion of the elongate concrete form;

stem cleaning means provided on said frame structure for cleaning a stem portion of the elongated concrete form;

means provided on said frame structure for lubricating the deck and stem portions of the elongated concrete form;

means provided on said frame structure for pulling at least one strand from a strand source for placement in the elongated concrete form;

means provided on said frame structure for placing at least one strand in a stem portion of the elongated concrete form;

means provided on said frame structure for tensioning at least one strand in the elongated concrete form;

means provided on said frame structure for placing at least one strand guide in a stem portion of the elongated concrete form for supporting at least one strand;

means provided on said frame structure for depressing at least one strand into a stem portion of the elongated concrete form; and

means provided on said frame structure for dispensing deck reinforcing material onto the deck portion of the elongated concrete form;

wherein said means for placing at least one strand guide in a stem portion of the elongated concrete form comprises

a strand guide support frame for supporting a plurality of strand guide members adjacent the stem portion, said strand guide support frame defining a discharge outlet for allowing the strand guide members to be deposited from said strand guide support frame into the stem portion; and

retention means associated with said discharge outlet for allowing a strand guide member to be selectively depos-

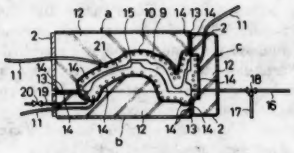
ited from said strand guide support frame, through said discharge outlet and into the elongated concrete form.

4,884,959

MOLD USED IN PRESSURE CASTING CERAMIC ARTICLES

Haruyuki Ito, and Akio Matsumoto, both of Kitakyushu, Japan, assignors to Toto Ltd., Kitakyushu, Japan

Filed Jul. 24, 1987, Ser. No. 77,655
Claims priority, application Japan, Jul. 26, 1986, 61-176369
Int. Cl.[4] B28B *1/26, 7/34, 21/08*
U.S. Cl. 425—84 12 Claims



1. A mold used in pressure slip casting ceramic articles, said mold comprising:

a plurality of mold parts set and clamped in combination and each mold part including:

a porous body having a low strength forming a filter layer with a generally even thickness and a plurality of channels formed therethrough for removing through the porous body water of the slip in a molding cavity formed between said mold parts by clamping together said mold parts and for injecting compressed air through the porous body toward a molded product during a demolding step and for evacuating air through the porous body so as t attract the molded product to said mold parts, with a majority of said plurality of channels running in parallel with a molding surface of said mold for allowing water and air to flow therethrough;

a reinforcing frame for fitting said porous body therein; and

a filler having a high compression strength relative to said porous body filling up the space between said porous body and said frame and for bearing most of the clamping pressure,

parting faces of said mold parts contacting each other and having a major portion of said parting faces formed by said filler to prevent slip under pressure from leaking from said molding cavity,

at least one of said mold parts including means for feeding slip into said molding cavity, and

at least one of said mold parts including means for blowing compressed air int said molding cavity to reduce water content of the molded product.

4,884,960

DIE FOR EXTRUDING AND WASH COATING

Tai-Hsiang Chao, Mt. Prospect, Ill., assignor to Allied-Signal Inc., Morris Township, N.J.

Filed May 6, 1988, Ser. No. 190,867
Int. Cl.[4] B29C *47/02, 47/30*
U.S. Cl. 425—97 10 Claims

1. An extrusion die for producing multichanneled honeycombed structures from an extrudable material and contacting the interior of the formed channels with a wash coat, said die comprising:

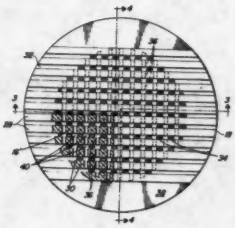
(a) a die body having a plurality of elongated and mutually parallel pins arranged in a series of rows;

(b) at least two sets of uniformly spaced slots defined by first ends of said pins, said sets of slots being oriented into an intersecting arrangement;

(c) a plurality of web sections interconnecting second ends of said pins;

(d) a plurality of feed passages defined by the second ends of said pins and said web sections, said passages communicating directly with said slots, at least a portion of said passages extending upstream of said web sections;

(e) an axial duct through the interior of each pin having an opening at said first end of each pin;



(f) a plurality of conduits located upstream, with respect to the flow of extrudable material, of said web sections, each of said conduits connecting the second ends of all of said pins in one of said rows, said conduit having a passageway in communication with the duct of each pin in said row; and

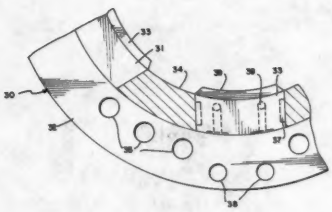
(g) means for distributing wash coat to each of said passageways.

4,884,961

APPARATUS FOR FORMING PLASTIC CONTAINERS

Takao Iizuka, Matsudo, and Akiho Ota, Funabashi, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 934,789, Nov. 25, 1986, abandoned, which is a division of Ser. No. 760,548, Jul. 30, 1985, abandoned.
This application Dec. 28, 1987, Ser. No. 137,948
Int. Cl.[4] B29C *49/28*
U.S. Cl. 425—195 20 Claims



1. A blow-mold of a configuration suitable for forming a heat-set container including at least one elongated recessed panel section, comprising:

plural mold members defining a mold cavity therebetween, and having at least one elongated removable insert member projecting from adjacent surfaces of said mold members for defining said panel section;

said blow-mold having heating means for heating walls defining said mold cavity; and

said insert member comprising means suitable for maintaining said insert member at a temperature above ambient but different from the temperature of said adjacent mold member surfaces, the back of said insert member adjacent one of said walls having a recessed portion to reduce heat

transfer from said adjacent mold member surfaces to said insert member.

4,884,962

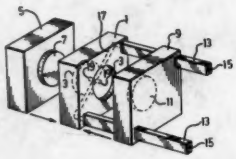
MULTIPLE SPREW BAR STACK MOLD

James Sheffield, Alliston, Canada, assignor to Izon Industries Inc., Rexdale, Canada

Filed Jun. 14, 1988, Ser. No. 206,307

Int. Cl.[4] B29C *45/12*

U.S. Cl. 425—234 2 Claims



1. A one by one stack mold with a middle mold section and first and second outside mold sections, said middle and first outside mold sections being movable relative to said second outside mold section, said middle mold section being provided with centrally positioned back to back mold cavities, said stack mold including a pair of sprue bars in balanced positions on opposite sides of said back to back mold cavities extending between said middle and said second outside mold sections, both of said sprue bars having flow paths therethrough and both of said flow paths terminating in a common inwardly directed feed passage which directs molten plastic material simultaneously to both of said back to back mold cavities so that in the event that one of said sprue bars becomes blocked, the other of said sprue bars continues to allow simultaneous flow of said molten plastic material to both of said back to back mold cavities and a bridge member across said pair of said sprue bars, said bridge member being interfacable* with a standard plastic injection nozzle and having an internal channel therethrough to both of said sprue bars.

4,884,963

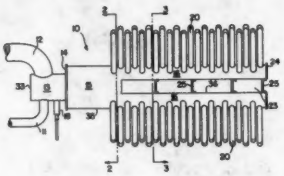
PULSE COMBUSTOR

Peter Kardos, Longmeadow, Mass., assignor to Gas Research Institute, Chicago, Ill.

Filed Aug. 5, 1988, Ser. No. 229,130

Int. Cl.[4] F23C *11/04*

U.S. Cl. 431—1 26 Claims



1. A pulse combustor comprising: at least one mixing and ignition chamber wall forming a mixing and ignition chamber, fuel inlet means, air inlet means, said mixing and ignition chamber in communication with said fuel inlet means and said air inlet means, fuel being introduced through said fuel inlet means and combustion air being introduced through said air inlet means forming a combustible fuel/air mixture in said mixing and ignition chamber, ignition means for igniting said combustible fuel/air mixture;

at least one combustion chamber wall forming a combustion chamber, said combustion chamber in communication with said mixing and ignition chamber, said combustion chamber having a plurality of downstream combustion chamber branches, said combustion chamber branches having an opening between at least one combustion chamber branch wall of each of said combustion chamber branches; and

a plurality of exhaust tubes having one end in communication with said combustion chamber branches, said exhaust tubes secured to each said combustion chamber branch along a longitudinal axis of said combustion chamber branch.

18. An improved pulse combustor of the type having a mixing chamber, ignition chamber, fuel inlet means and air inlet means, said air inlet means and said fuel inlet means introducing combustion air and fuel respectively to form a combustible fuel/air mixture, and ignition means for igniting said combustible fuel/air mixture, wherein the improvement comprises: said combustion chamber having a plurality of downstream combustion chamber branches, said combustion chamber branches having a slot between at least one combustion chamber branch wall of each said combustion chamber branch, and a plurality of exhaust tubes having on end in communication with said combustion chamber branches.

4,884,964

FILE ASSEMBLY FOR USE IN A GAS LIGHTER

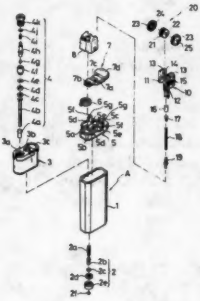
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

Filed Dec. 15, 1988, Ser. No. 284,623

Claims priority, application Japan, Dec. 28, 1987, 62-197396[U]

Int. Cl.[4] F23Q *1/02*

U.S. Cl. 431—277 2 Claims



1. A file assembly which is adapted to be fitted in and integrally connected to the top of a gas lighter housing having file support projections, characterized in that it comprises: a rotatable file disk having an axle; and a file block having two opposite support plates each having a slot made on its inside surface, leaving its outside surface for ornamental space, each slot being wide enough to permit insertion of a corresponding file-support projection of the top of the gas lighter housing and being long enough to leave a space for snugly accomodating each end of the axle of the file disk after inserting each corresponding file-support projection in each slot.

4,884,965

GASLIGHTER STRUCTURE PERMITTING PUSH-FIT ASSEMBLING OF ITS MAIN PARTS

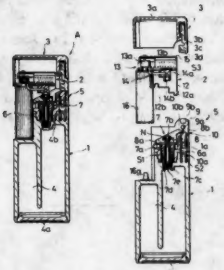
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

Filed Dec. 16, 1988, Ser. No. 285,457

Claims priority, application Japan, Dec. 28, 1987, 62-197397[U]

Int. Cl.[4] F23Q *1/02*

U.S. Cl. 431—277 2 Claims



1. A gaslighter comprising:

a lighter housing constituting a gas well and having a gas ejection nozzle fixed to the top of the housing and pivot means provided to the rear, upper side of the housing;

a fire-striking unit including a holder covered with an inner cap which has a flame opening at its front end, said holder having push-fit means to integrally combine the holder with the housing, a fire-striking assembly fixed to the holder in the vicinity of the flame opening, and a pipe laid on the underside of the holder with its head tip close connected to the flame opening and its tail tip connected to the gas ejection nozzle; and

a cap having counter pivot means to the pivot means of the housing, thereby permitting the cap to rotate about its pivot for closing and disclosing the fire-striking unit on the top of the housing.

4,884,966

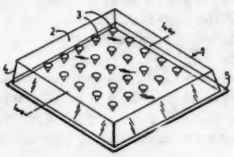
PROTECTIVE CAKE COVER AND CANDLE HOLDER

Ethel Wexler, 23108 L'Ermitage Cir., Boca Raton, Fla. 33433

Continuation-in-part of Ser. No. 80,915, Aug. 3, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 233,537

Int. Cl.[4] F23D *3/16*; A47G *19/30*

U.S. Cl. 431—295 24 Claims



1. A combined candle holder and cake cover for holding candles and protecting rectangular cakes, comprising:

a substantially rectangular, and flat horizontal top having four edges of a transparent material to permit viewing said cake while covered;

a plurality of indentation means in said top extending downwardly below said top, each said indentation means having an opening at its upper end for receiving a candle and a lower portion below said top said lower portions all arranged in a common plane for supporting the lower ends of said candles in a common plane in a substantially vertical position within said indentation means said lower portions providing means for engaging cover support means on the outside of said lower portion;

four sloped sides, one extending downwardly from each of said four edges of said top; and

flange means extending horizontally from the lowermost edges of said sides, said sides and flange means providing structural stability to said cover.

13. A combined candle holder and cake cover for holding candles and protecting rectangular cakes of different sizes, comprising:

(A) a first portion, including;

(1) a substantially rectangular, horizontal top of a transparent material to permit viewing said cake while covered;

(2) a plurality of downwardly extending indentation means in said top for holding said candles in a vertical position;

(3) sloped sides extending downwardly from three edges of said top, said top having a free edge without a side;

(4) flange means extending horizontally from the lowermost edges of said sides, said sides and flange means providing structural rigidity to said cover;

(B) a second portion, including;

(1) a substantially rectangular, horizontal top of a transparent material to permit viewing said cake while covered;

(2) a plurality of downwardly extending indentation means in said top for holding said candles in a vertical position;

(3) sloped sides extending downwardly from three edges of said top, said top having a free edge without a side;

(4) flange means extending horizontally from the lowermost edges of said sides, said sides and flange means providing structural rigidity to said cover;

(C) said first portion and said second portion provided with means for nesting together with said free edges overlapping one another for adjusting to said cakes of different size, with said indentation means of said first portion fitting into said indentation means of said second portion at overlapping positions.

4,884,967

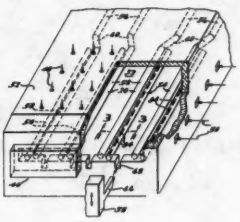
STEEL REHEATING FURNACE

Robert W. Meyer, Novi, Mich., assignor to Combustion Concepts, Inc., Detroit, Mich.

Filed Sep. 26, 1988, Ser. No. 249,503

Int. Cl.[4] F27D *3/04*

U.S. Cl. 432—127 23 Claims



19. A steel reheating furnace characterized by a plurality of elongated, longitudinally extending, heating elements and associated skid rails, each rail having laterally offset primary portions with each portion supporting either a respective first or second area on the bottom of a slab as it passes through the furnace, the areas being side-by-side, the heating elements

directing their heat at the associated first area when the second area is supported by the associated rail portion, whereby to eliminate skid marks caused by rail portions otherwise shielding the slab from heat in the furnace.

4,884,968

PROTECTIVE DEVICE FOR DENTIST HANDPIECE

Jerome A. Stien, 32 Stagecoach La., Newington, Conn. 06111

Filed May 2, 1988, Ser. No. 189,219
Int. Cl.[4] A61C *1/16*
U.S. Cl. 433—116 4 Claims

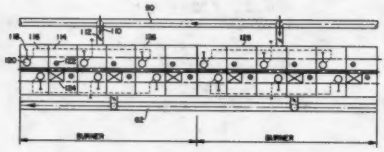
1. In combination with a dentist's handpiece of the type that includes a handle portion and a generally cylindrical head portion provided perpendicularly to the handle, and wherein the head includes a chuck for receiving a dentist's bit or bur, said bur projecting beyond the head and being rotatable on the axis or centerline of the head, a protective shield for the bit or bur, said shield having a substantially cylindrical shape with an upper annular edge and snugly receiving said head, and said shield having an annular cross section that defines a depending skirt surrounding the bit or bur, said shield fabricated from a plastic material so that said shield is frictionally retained on the head by engagement between the inner cylindrical surface of the shield and the outer cylindrical surface of the head, said shield including a slot upwardly open in said upper annular edge and terminating at a location above a lower edge of said shield, said slot being of such a width as to snugly receive the handle portion of the handpiece, and said slot having an inner end that abuts the handle to define a position for the shield such that the depending skirt surrounding the bit or bur extends beyond the end of the bit or bur.

4,884,969

TUNNEL KILN

Kölln Bernd, Ammerndorf, and Rüdiger Grün, Lauf, both of Fed. Rep. of Germany, assignors to Ludwig Riedhammer Gmbh, Fed. Rep. of Germany

PCT No. PCT/DE86/00465, § 371 Date Jul. 6, 1987, § 102(e) Date Jul. 6, 1987, PCT Pub. No. WO87/03078, PCT Pub. Date May 21, 1987
PCT Filed Nov. 13, 1986, Ser. No. 86,690
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1985, 3540764
Int. Cl.[4] F27B *9/02*
U.S. Cl. 432—133 6 Claims



1. A burner for a tunnel kiln, in particular a tunnel kiln for fine ceramic products comprising a preheating section, a firing section equipped with burners and a cooling section adjacent thereto, with a gas conveying means arranged at the products entrance which takes in gas from at least said firing section to said products entrance in the opposite direction with respect to the conveying direction of said products, and with at least one air transport means for transporting air to said cooling section, characterized in that said gas conveying means (10) takes in gases also from the region of said cooling section (140, 176, 182) and conveys them into said firing section (42, 78, 80, 126, 128), and that at least one additional burner (132) is arranged in a transition region between said firing section (128) and said cooling section (140),

that a burner tube (214) is provided, one end section of which has means (216) for connecting a fuel line, and the other end section of which has at least one recess (228) for taking in combustion air, said tube having at its inside fuel guiding means (222) tapering off into a fuel nozzle (224) which ends before said recess (228), and

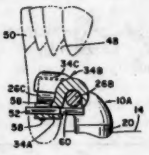
that two oval-shaped recesses (228) arranged in symmetric fashion in the wall of said burner tube (214) are provided, where the longer axis of said oval extends in parallel relationship to the longitudinal axis of said burner tube (214).

4,884,970

ATTACHMENT FOR REMOVABLY SUPPORTING A DENTURE IN THE MOUTH OF THE USER

Ralph C. Mays, 6740 S. 69th East Ave., Tulsa, Okla. 74133

Continuation-in-part of Ser. No. 221,212, Jul. 19, 1988, which is a continuation-in-part of Ser. No. 90,456, Aug. 28, 1987, Pat. No. 4,784,608. This application Oct. 31, 1988, Ser. No. 264,858
Int. Cl.[4] A61C *13/22*
U.S. Cl. 433—172 6 Claims



1. An attachment for removably supporting a denture in the mouth of a user having at least two spaced apart dental posts installed in the user's alveolar ridge, such two posts being in the front of, and one to each side of, the center of the mouth of the user, the attachment comprising:

an anchor member fitable into the mouth of the user for attachment such as by screws to two spaced apart posts in the front of the mouth of the user, the anchor member having a bar portion extending between the two spaced apart posts;

a denture member which conforms generally to the anchor member and is engagable in proximity with said anchor member bar portion, the denture member being castable into a denture having simulated gum portions and teeth portions;

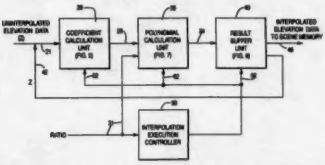
locking means of removably and pivotally interlocking said denture member with said anchor member bar portion when a denture having said denture member formed therein is in usable position with the mouth of the user; and

pivotation limiting means formed as a part of said anchor member and said denture member limiting the angle of pivotation in one direction of said denture member to said anchor member about said bar portion when said denture member is interlocked with said anchor member.

4,884,971
ELEVATION INTERPOLATOR FOR SIMULATED RADAR DISPLAY SYSTEM

Luen C. Chan, Boonton, N.J., and Jay P. Menozzi, Altamonte Springs, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jul. 14, 1988, Ser. No. 73,084
Int. Cl.[4] G09B 9/00
U.S. Cl. 434—2 21 Claims



1. For use with a signal processing system in which a plurality of data signals representative of points on a prescribed functional characteristic are processed to derive an output signal function, a method of generating a continuous interpolated functional characteristic points on which include points on said prescribed functional characteristic and points lying between successive points on said prescribed functional characteristic comprising the steps of:

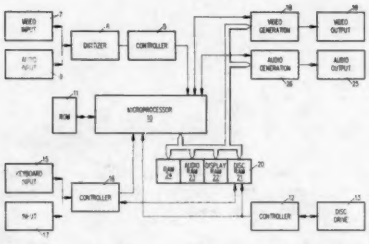
(a) generating a signal processing operator in accordance with input data signals representative of successive points on said prescribed functional characteristic, said signal processing operator defining the value of said interpolated functional characteristic at at least one point between said successive points on said prescribed functional characteristic such that the magnitude of said prescribed functional characteristic at said successive points is preserved, the slope of said interpolated functional characteristic at said successive points is continuous, and such that the sign of the slope of said interpolated functional characteristic between said successive points does not change; and

(b) applying plural input data signals to said signal processing operator and causing said signal processing operator to generate a plurality of output signals representative of interpolated values of said interpolated functional characteristic between said successive data points.

4,884,972
SPEECH SYNCHRONIZED ANIMATION

Elon Gasper, Garberville, Calif., assignor to Bright Star Technology, Inc., Bellevue, Wash.

Filed Nov. 26, 1986, Ser. No. 935,298
Int. Cl.[4] G09B 19/04
U.S. Cl. 434—185 33 Claims



1. Apparatus for producing and displaying randomly-accessible animated objects having synchronized audio and visual features, said apparatus comprising:

a program-controlled microprocessor;

integrator means, coupled to the microprocessor, for producing signals representing encoded elements of sound and encoded elements of constituent object parts in response to command signals from the microprocessor;

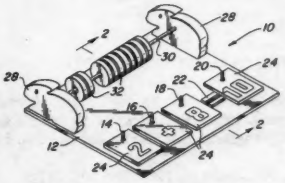
sound emitting means, coupled to the microprocessor and to the integrator means for producing sound in response to the signals representing encoded elements of sound; and

display means coupled to the microprocessor, to the integrator means and sound emitting means for producing visual images of the animated objects in response to the signals representing encoded elements of constituent object parts, the visual images of the animated objects being synchronized with the sound.

4,884,973
MATHEMATIC TEACHING AID

Kyoungsik Pak, 371 Sweetbriar Rd., King of Prussia, Pa. 19406

Filed Jan. 18, 1989, Ser. No. 298,168
Int. Cl.[4] G09B 1/10, 19/02
U.S. Cl. 434—191 4 Claims



1. Apparatus for visually representing an algebraic equation comprising, in combination:

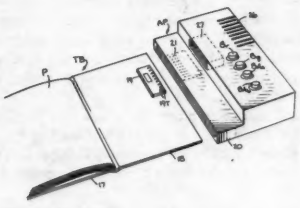
a panel having a plurality of connectors aligned at positions corresponding to the terms of the equation, and bearing an equal sign between the penultimate and lastconnectors; and

cards formed to engage selected ones of said connectors, at least one of saidcards bearing the sign of a mathematical operator and the remainder bearing discrete integers.

4,884,974
INTERACTIVE TALKING BOOK AND AUDIO PLAYER ASSEMBLY

Eric DeSmet, Sint Niklaas, Belgium, assignor to View-Master Ideal Group, Inc., New York, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,739
Int. Cl.[4] G09F 27/00
U.S. Cl. 434—317 14 Claims



1. A talking book and audio player assembly comprising:

A a book having a hard back cover and a plurality of pages, each carrying a printed text and a bar code printed along the end margin of the page formed by a series of light

reflective and non-reflective elements that identify the page;

B a ROM module secured to the end margin of the back cover and having exposed terminals, said module having stored therein a like plurality of digitized spoken messages, each message corresponding to the printed text on a respective page of the book; and

C an audio player having a base inlet adapted to receive the end margin of the back cover, whereby when the pages thereof, when turned, overlie the inlet, the inlet being provided with inlet contacts that engage the terminals of the ROM module, and electronic means connected to the module through said inlet contacts to read out the digitized messages from the module and convert these messages into audio signals which are reproduced by a loudspeaker and heard by a reader as spoken messages, said audio player including a light sensor array which is laterally displaced from the bar code so as not to interfere with the pages overlying the inlet and is in operative optical relation to the bar code on the page then open to view to produce a page-identifying signal which effects selection for readout from the module of the digitized message corresponding to the printed text on the open page, the audio player being common to talking books of the same type but having different texts.

4,884,975

CENTERING STRIP FOR USE WITH A BACKPLANE PRINTED CIRCUIT BOARD

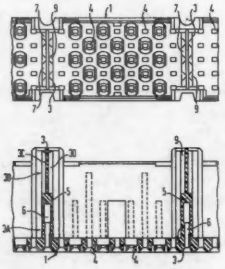
Leo Pelzl, Holzkirchen; Peter Seidel, Grobenzell, and Karl Zell, Niederpocking, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 11, 1987, Ser. No. 13,566

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3610418

Int. Cl.[4] H01R *13/64, 23/68*

U.S. Cl. 439—78 **6 Claims**



1. A centering strip for plugging onto a backplane printed circuit board having contact blades, which are received in openings in a floor of the center strip, said center strip also having a housing opening for accepting a plug, comprising:

a plurality of segments divided from one another by transversely oriented partitions;

each of said partitions having a lower half portion with a cavity for acceptance of the contact blades;

each of said partitions having an upper half portion with first and second sides forming a mechanical coding device for mating with the plug;

solid middle part separating said upper and lower parts of each of said partitions and extending a maximum width of said partitions; and

depth of said cavities dimensioned such that said centering strip is supported on the contact blades at substantially said solid middle part of said partition.

4,884,976

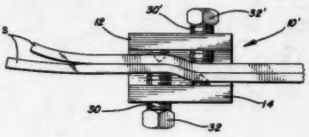
CLAMP FOR ELECTRICALLY CONDUCTIVE STRIPS

George J. Franks, Jr., 664 Thompson Cir., Inverness, Ill. 60067

Continuation-in-part of Ser. No. 116,899, Nov. 3, 1987, Pat. No. 4,828,504. This application Aug. 22, 1988, Ser. No. 234,975

Int. Cl.[4] H01R *4/66*

U.S. Cl. 439—92 **13 Claims**



1. A clamping device for mechanically and electrically connecting together two strips of electrically conductive materials, comprising:

first and second legs extended outwardly from a common base for positioning therebetween the two strips;

a point rigidly mounted to and extending outwardly from the first leg toward the second leg and having a hardened tip with respect to the material of the strips; and

threaded stud means rotatably mounted within a bore in the second leg and positioned coaxially with the point, the threaded stud means extending outwardly towards the first leg and having a free end with an abrading surface surrounding a recess and rotatable to affect axial movement to clamp the two strips between the hardened tip and the abrading surface with a portion of the material of the strip being forced into the recess on the threaded stud means to thereby form a mechanical and electrical connection between the two strips wherein the threaded stud means has a head with a bore formed therein for receiving a conductor, and securing means for clamping the conductor to the head.

4,884,977

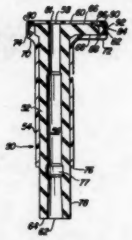
REINFORCED BOOT FOR SPARK PLUG CABLES

Ronald P. Sturdevan, Tifton, Ga., assignor to Prestolite Wire Corporation, Farmington Hills, Mich.

Division of Ser. No. 120,940, Nov. 13, 1987, Pat. No. 4,810,198. This application Jan. 10, 1989, Ser. No. 295,457

Int. Cl.[4] H01R *13/516*

U.S. Cl. 439—125 **11 Claims**



1. A reinforced boot for a spark plug cable and for a spark plug cable terminal electrically and mechanically connected to said spark plug cable, comprising:

a rigid shell;

an elastomer boot circumscribed by said rigid shell for giving columnar strength to said elastomer boot, said elastomer boot having a central bore, said central bore having a

first portion structured to receive said spark plug cable terminal and a predetermined portion of said spark plug cable, said central bore further having a second portion structured to receive a spark plug;

a flange provided on one end of said elastomer boot;

a cup provided at the corresponding end of said rigid shell for receiving said flange therein; and

a cap removably attached to said cup for retaining said flange in said cup, said cap having an aperture concentric with said central bore.

4,884,978

CONNECTOR

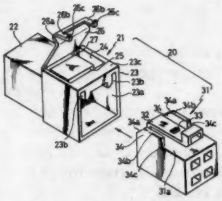
Shigemitsu Inaba; Kazuto Ootaka, and Akira Maeda, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Nov. 25, 1988, Ser. No. 275,964

Claims priority, application Japan, Nov. 25, 1987, 62-295142

Int. Cl.[4] H01R *13/627*

U.S. Cl. 439—352 **17 Claims**



1. A connector, comprising:

a female housing;

a male housing inserted and fitted into said female housing for establishing an electrical connection therebetween;

lock means pivotably provided on one of said female and male housings in such a manner that said one housing is locked with the other housing by said lock means only when said female and male housings are properly fitted together;

means for temporarily hooking said locking means to the one housing until the other housing is inserted into said one housing, said hooking means provided on said lock means; and

means for disengaging said lock means from said one housing while the other housing is inserted into said one housing, said disengaging means provided on the other housing.

4,884,979

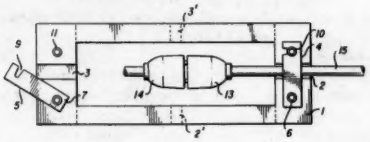
EXTENSION CORD CLAMP

Henry M. Budner, 1926 Rodman St., Hollywood, Fla. 33020

Filed Apr. 14, 1989, Ser. No. 339,016

Int. Cl.[4] H01R *13/58*

U.S. Cl. 439—369 **11 Claims**



1. An extension cord clamp for reinforcing a connection between two components attached to cords, comprising:

(a) a frame including sides and a central opening for receiving the components;

(b) two mutually opposite channels each being formed substantially centrally in a respective one of said sides;

(c) two pivot pins each being fastened to a respective one of said sides of said frame in the vicinity of a respective one of said channels, two tabs each being pivotable about a respective one of said pivot pins into a closed position, said tabs each having an edge facing toward said central opening in said closed position, said edges each having a respective notch formed therein; and

(d) two locking pins each being fastened to a respective one of said sides of said frame in the vicinity of a respective one of said channels for engaging a respective one of said notches and locking said tabs to said frame with the cords in said channels and said tabs in said closed position, said tabs adapted to be biased against the cords to retain the cords in said channels.

4,884,980

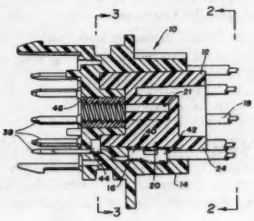
INSERT MOLDED MULTIPLE CONTACT ELECTRICAL CONNECTOR

Gregory L. Bensing, Cortland; Thomas M. Nadasky, Berlin Center, and Raymond C. Wright, Hubbard, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 15, 1988, Ser. No. 144,189

Int. Cl.[4] H01R *13/504*

U.S. Cl. 439—606 **9 Claims**



1. An electrical connector comprising:

a molded insert of thermoplastic insulating material having a body which has a groove and a cable grip at one end which is aligned with the groove,

an electrical contact which is attached to an electric cable, said electrical contact and said electric cable being disposed in the groove and the cable grip respectively to form a subassembly, and

an outer housing of thermoplastic insulating material which is molded over the subassembly in a die which has a cable grip part which cooperates with the cable grip of the molded insert to retain and seal around the electric cable when the outer housing of thermoplastic insulating material is molded over the subassembly whereby the molded insert has a portion of the cable grip which is exposed after the outer housing has been molded over the subassembly.

4,884,981

SHIELDED DATA CONNECTOR

Curtis S. Chandler, King, and Edward K. Marsh, Kernersville, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 945,403, Dec. 22, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 173,338

Int. Cl.[4] H01R *9/03*

U.S. Cl. 439—610 **30 Claims**

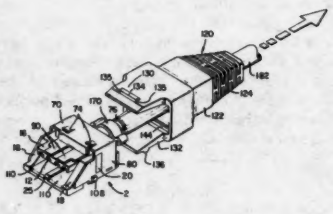
1. An electrical connector for interconnection to a shielded cable, the connector comprising:

an insulative housing including a terminal support floor, and

sidewalls extending upwardly therefrom, the terminal support floor including terminal receiving means;

a plurality of terminals disposed within said housing positioned within said terminal receiving means, each said terminal having a wire termination means;

shielding means substantially surrounding said insulative housing, the shielding means including at least one tab struck outwardly therefrom; and



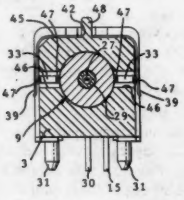
a one-piece premolded insulative boot means having a forward cavity profiled for receiving the insulative housing and the shielding means therein, the forward cavity including an internal latching shoulder for receiving the at least one tab of the shielding means in latchable engagement, thereby securing the insulative boot means to the shielding means, the boot means being slidably receivable over said insulative housing and said shielding means encapsulating said insulative housing and shield means therein.

4,884,982

CAPACITIVE COUPLED CONNECTOR

David F. Fleming, Palmyra; Harold W. Kerlin, Port Royal; William V. Pauza, Palmyra, and Wilmer L. Sheesley, Dauphin, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 3, 1989, Ser. No. 330,995
Int. Cl.[4] H01R *13/66*
U.S. Cl. 439—620 **4 Claims**



1. In an electrical coaxial connector for mounting to a conductive panel and comprising, an insulated inner signal transmitting contact, an insulated outer conductive shell and a coupling portion for coupling the shell to the panel, wherein the improvement comprises:

electrical capacitor elements inset within an outer profile of the connector,

a conductive clip inset within the outer profile and holding said capacitor elements in pressure contact with said shell, and

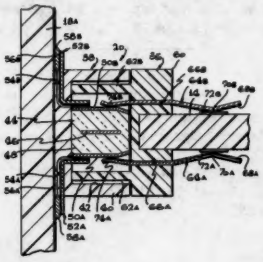
contact surfaces of said clip establishing a capacitive electrical coupling of said shell and the panel by engaging the panel.

4,884,983

RESOLDERABLE ELECTRICAL CONNECTOR

Robert A. Morrison, Long Beach, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Jan. 27, 1989, Ser. No. 302,287
Int. Cl.[4] H01R *4/02*
U.S. Cl. 439—874 **5 Claims**



1. An electrical connector comprising:

a first connector half comprising:

a first housing;

a heating element mounted within said first housing said heating element further having at least one non-electrically conductive surface, said element having a set of electrically conductive surface traces mounted on said at least one surface; and

a set of first contacts mounted in said first housing having one end of said first contacts joined to a first portion of said surface traces on said at least one surface;

a second connector half for mating with said first half comprising:

a second housing; and

a set of second electrical contacts mounted in said second housing for contacting a second portion of said surface traces on said at least one non-conductive surface when said connector halves are joined; and

a coating of solder on said second portion of said surface traces or said one end of said second electrical contacts or both;

such that when said first and second connector halves are joined and said one ends of said second electrical contacts are in contact with said second portions of said surface traces on said heating element, said heating element can be activated to melt said solder and thereafter deactivated, causing said solder to cool deactivated and solidify, joining said one ends of said second electrical contacts to said second portions of said surface traces.

4,884,984

CRIMP CONNECTOR AND METHOD OF ATTACHING WIRE TO IT

Masatsugu Matsumoto, Tokyo, Japan, assignor to Create System Co., Ltd., Tokyo, Japan

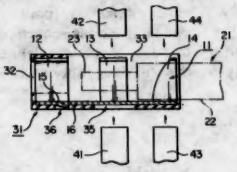
Filed Dec. 29, 1988, Ser. No. 291,741
Claims priority, application Japan, Mar. 12, 1988, 63-58879
Int. Cl.[4] H01R *4/10*
U.S. Cl. 439—877 **6 Claims**

1. A crimp connector, comprising a socket housing having received therein a crimp terminal comprising a contact, at least a pair of claws for holding a stripped portion of a wire, and at least a pair of claws for holding an unstripped portion of the wire, said housing being provided;

at a front end face thereof with an opening for said contact;

at a top thereof with an opening through which the wire is inserted and crimpers to crimp the stripped portion hold-

ing claws and the unstripped portion holding claws are inserted; and



at a bottom thereof with an opening through which an anvil to crimp said stripped portion holding claws is inserted.

4,884,985

ELASTICALLY SUPPORTED THRUSTER STRUCTURE

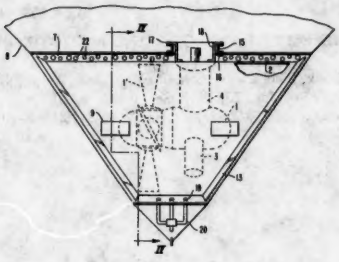
Arnfinn Dyrkorn, Molde, Norway, assignor to Brödr. Brunvoll Motorfabrikk A/S, Molde, Norway

Division of Ser. No. 645,744, Aug. 28, 1984, Pat. No. 4,629,432. This application Nov. 25, 1985, Ser. No. 802,338

Claims priority, application Norway, Feb. 4, 1983, 830384

Int. Cl.[4] B63H *21/30*

U.S. Cl. 440—52 **4 Claims**



1. In an elastically supported propeller thruster installation for propulsion and/or steering of a ship, particularly a thruster in which a propeller operates in an open tunnel through the hull of the ship, said installation being of the type including an outer tunnel tube rigidly secured to the hull structure of the ship, an inner tunnel tube, a propeller unit rigidly supported in said inner tunnel tube, connection means for elastically supporting said inner tunnel tube coaxially within said outer tunnel tube with an annulus therebetween, the improvement comprising:

means for supplying a continuous stream of gas into said annulus and thereby for forming a plurality of gas bubbles in said annulus and forming therein sound absorbing means on the form of a cushion of said gas bubbles; and

said annulus has opposite ends which are unsealed and open to the surrounding water, thereby enabling escape of said gas bubbles from said annulus.

4,884,986

SWIMMER'S PROPULSION AID

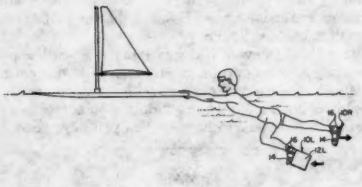
Yoram Gil, 1441 S. Beverly Glen Rd., Los Angeles, Calif. 90024

Filed Sep. 19, 1988, Ser. No. 245,812

Int. Cl.[4] A63B *31/11, 31/14*

U.S. Cl. 441—60 **6 Claims**

1. In a swimming propulsion aid: a foot wing adapted to be secured to the foot of a swimmer by a foot strap affixed to said wing for surrounding attachment to the forward portion of the swimmer's foot and by an ankle strap affixed to said wing rearwardly of said foot strap for surrounding attachment to the rearward portion of the swimmer's foot and ankle whereby said wing extends from the inner edge of the foot laterally under the foot sole and outwardly therefrom to provide an enlarged and effective thrust area for pushing action with respect to surrounding water during the leg extension portion of a reciprocating leg stroke by the swimmer; and wing pivot means aligned with the inside of the swimmer's foot compris-



ing the foot strap and ankle strap at the point whereat said straps are affixed to said foot wing so that during the retracting portion of said leg stroke the foot wing swings inwardly into near longitudinal alignment with the leg and inner foot edge of the swimmer whereby upon alternating leg strokes the swimmer is more effectively and forcefully propelled through the water.

4,884,987

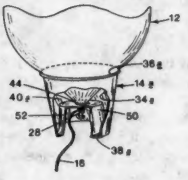
GONDOLA ATTACHMENT FOR HELIUM-FILLED TOY BALLOON

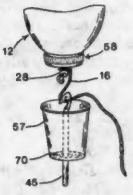
Charles P. Mason, 786 S. Merle, Wheeling, Ill. 60090

Filed Dec. 9, 1988, Ser. No. 282,396

Int. Cl.[4] A63H *27/10*

U.S. Cl. 446—77 **7 Claims**





1. In a toy balloon-gondola combination having a helium-filled balloon with a filling stem, and a gondola adapted to be secured to the balloon stem with the latter substantially hidden within the gondola, the improvement comprising:

said gondola being in the form of a tubular member having a peripheral sidewall with upper and lower edges, a cross member, and an inner sidewall;

said inner sidewall lying adjacent said peripheral sidewall and being integral therewith at its lower end and otherwise being inwardly spaced therefrom and being integral at its upper end with the cross member;

means on the cross member adapted to cooperate with the

balloon stem, when the stem is extended from an upper side of the cross member to a lower side thereof, for securing the balloon stem and cross member together;

said gondola tubular member being open at its upper and lower ends and said cross member being manually accessible from both the upper and lower open ends;

said cross member being at a location spaced intermediate said upper and lower edges of the peripheral sidewall, for holding the balloon relative to the gondola, with the balloon underside drawn against the upper edge of the peripheral sidewall; and

said peripheral sidewall and said inner sidewall each being tapered, in the opposite directions, with the peripheral sidewall converging from a wider open upper end toward the lower end to allow like gondola tubular members to be nested within one another via the open upper end.

4,884,988

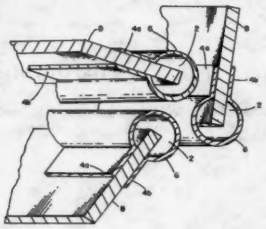
INTERCONNECTING BUILDING TOY PANELS

Larry D. McMurray, 14421 29th Ave., S., Seattle, Wash. 98168

Continuation-in-part of Ser. No. 130,162, Dec. 8, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 255,846

Int. Cl.[4] A63H *33/08, 3/52;* **A47G** *5/00*

U.S. Cl. 446—115 **8 Claims**



1. Apparatus for interconnecting panels to form play structures comprising panels having edges, said panels having edging means, attached to the edges of the panels, said edging means having a flange portion and a cylindrical portion connected to said flange portion, said flange portion having an interior slot receiving the edge of a panel and with attachment means affixing said edging means to said edges, said edging means having an exterior surface, said exterior surface having a hook cloth material attached thereto, said hook cloth material overlaid with a loop material, said loop material being attached to said hook cloth material whereby said hook cloth material and loop material of one edging means is attachable to said hook and loop material of the edging means of another panel so that panels may be interconnected to form play structures.

4,884,989

TOY FOR TUMBLING DOWN VERTICAL SURFACE

Tak K. Wong, Hong Kong, Hong Kong, assignor to T. K. Wong & Associates, Ltd., Hong Kong

Filed Dec. 28, 1988, Ser. No. 291,105

Claims priority, application United Kingdom, Sep. 23, 1988, 8822445

Int. Cl.[4] A63H *15/00*

U.S. Cl. 446—168 **5 Claims**

1. A toy which under the influence of gravity will travel down a substantially vertical surface, said toy comprising

two separate and pivotally connected parts adapted for being positioned one above the other on a surface,

each said part including two separated regions of a sticky material, and a pair of said regions defining a respective axis of rotation or tumbling of said toy down the surface, the axis extending generally along the surface,

the adhesivity of the regions of sticky material being selected so that said regions of sticky material will adhere to the surface when they first contact the surface and then under the influence of gravity acting on the toy the then upper said regions will become detached from the surface so as to free said toy to rotate or tumble successively down the surface about the said axis of rotation defined at said pair of said sticky regions still then adhering to the surface,

the two said parts being pivotably connected together so that said toy is arrangeable in a first configuration in which said regions of sticky material lie in a common plane and in a second configuration in which said regions of sticky material lie at the corners of a tetrahedron.

4,884,990

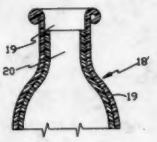
LUMINESCENT BALLOON AND METHOD OF MANUFACTURE THEREOF

Craig J. Lovik, 8565 Custer School Rd., Custer, Wash. 98240

Filed Jan. 23, 1989, Ser. No. 299,310

Int. Cl.[4] A63H *3/06, 33/22;* **B32B** *7/02;* **F21V** *9/16*

U.S. Cl. 446—220 **20 Claims**



16. A luminescent balloon comprising, in combination:

(a) a first resilient inflatable outer sidewall lamination formed essentially of latex and providing structural integrity for said balloon; and,

(b) a second resilient inflatable inner sidewall lamination formed of:

(i) a latex carrier; and,

(ii) luminescent mineral pigment particles distributed substantially homogeneously throughout said latex carrier, said second inner sidewall lamination being in face-to-face bonded contact with said first outer sidewall lamination.

4,884,991

POSEABLE SOFT DOLL

Rouben T. Terzian, Chicago, Ill., assignor to Breslow, Morrison, Terzian & Associates, Inc., Chicago, Ill.

Filed Feb. 9, 1989, Ser. No. 308,438

Int. Cl.[4] A63H *3/02*

U.S. Cl. 446—369 **2 Claims**

1. A soft doll comprising in combination:

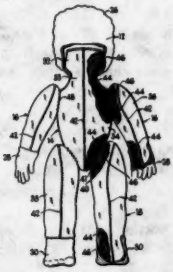
a plurality of hollow body parts formed of a flexible material;

each of the body parts defining a volume;

means connecting the body parts together to simulate a torso and limbs;

a freely flowable particulate filler within the body parts;

the particulate filler having a generally spherical pieces approximately sixty-thousands of an inch in diameter or less;



the particulate filler occuping less than all of the volume of each of the body parts; and

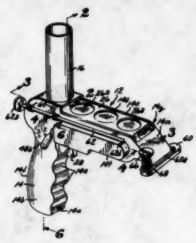
the remaining volume of each of the body parts being filled with a relatively less freely flowable, normally expanded, readily compressible stuffing material that readily returns to its normal expanded condition when a compressing force is removed.

4,884,992

COIN-DISPENSING APPARATUS

Michael L. Grimes, 320 B Catalina Dr., Newport Beach, Calif. 92663

Filed May 27, 1988, Ser. No. 199,808
Int. Cl.[4] G07D *1/08, 9/04*
U.S. Cl. 453—29 **7 Claims**



1. Coin-dispensing apparatus comprising, in combination,

a main body having a coin outlet and a reservoir of coins,

coin transport means to transport coins from said reservoir to said outlet comprising an endless belt having receptacles for coins and being mounted on spaced rollers rotatably mounted on said main body,

actuating means for said endless belt including a manual lever on said main body and lost-motion interconnecting means between said lever and one of said rollers including a pair of rotatable discs having mating engaging inclined surfaces, a drive wheel fixed to the drive one of said discs and a flexible belt operable by said lever and having an irregular surface engageable with an irregular peripheral surface on said drive wheel, and

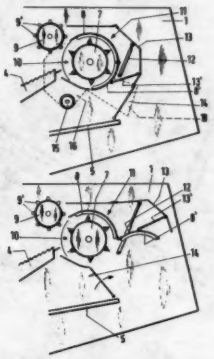
means for varying the permitted movement of said actuating lever to thereby control the number of coins dispensed with a single motion of said lever.

4,884,993

HARVESTER THRESHER

Heinrich Hemker, and Franz Heidjann, both of Harsewinkel, Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Oct. 19, 1988, Ser. No. 259,751
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735669
Int. Cl.[4] A01F *7/04, 12/18*
U.S. Cl. 460—14 **15 Claims**



1. A harvester thresher, comprising a chassis; a housing; a threshing and separating mechanism operating in accordance with the principle of a tangential flow and including a threshing drum and a threshing basket; a shaker located after said threshing mechanism as considered in direction of an agricultural product flow; and a threshing and separating device located after said shaker in said housing, operating in accordance with the principle of axial flow and including a rotor and a casing.

4,884,994

AXIAL FLOW ROTARY SEPARATOR

James W. Hall, Bettendorf, Iowa; Maurice A. Popelier, East Moline, Ill.; Josef W. Klimmer, Zweibrucken, Fed. Rep. of Germany; Neil L. West, and Loren W. Peters, both of Bettendorf, Iowa, assignors to Deere & Company, Moline, Ill.

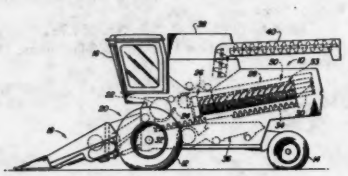
Continuation of Ser. No. 861,468, May 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 646,346, Aug. 29, 1984, Pat. No. 4,611,605. This application Jan. 20, 1988, Ser. No. 144,773
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.
Int. Cl.[4] A01F *7/06*
U.S. Cl. 460—66 **19 Claims**

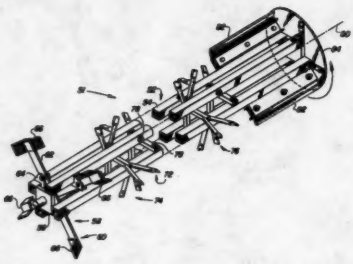
1. In an axial flow rotary separator having an at least partially foraminous casing, in which crop material is propelled downstream in a generally spiral path as an annular mat generally in contact with the inside of the casing, the casing carrying internal guide surfaces for engaging the crop material mat and oriented so as to assist the downstream movement of the mat, a rotor mounted eccentrically towards a foraminous portion of the casing, for rotation about an axis of rotation generally parallel to the longitudinal axis of the casing and for propelling the crop material through the casing, comprising:

a frame;

a plurality of generally radially extending crop material engaging elements carried by the frame, each element being pivotably attached to the frame for pivoting displacement under operating load in a direction such as to increase radial clearance between the element and the casing, and including an outer crop-propelling portion,

said portion having a predominating crop deflecting surface, said surface having a rotationally leading portion and





a rotationally trailing portion downstream of the leading portion so that in operation, crop material engaged by the deflecting surface is urged in a downstream direction.

4,884,995

HYDRAULIC TORQUE IMPULSE GENERATOR

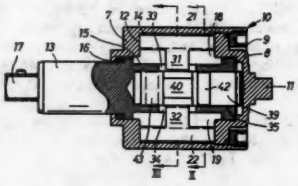
Knut C. Schoeps, Tyresö, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed May 2, 1988, Ser. No. 190,261

Claims priority, application Sweden, May 8, 1987, 8701912-1

Int. Cl.[4] B25B *21/02*; B25D *15/00*

U.S. Cl. 464—25 **6 Claims**



1. Hydraulic torque impulse generator, comprising:

a drive member (10) connected to a rotation motor and including a cylindrical fluid chamber (12) partly defined by a circumferential fluid chamber wall (14), said fluid chamber wall (14) having seal lands (23, 24) thereon;

an output spindle (13) rotatably supported in coaxial relationship with said drive member (10) and being rotatable relative to said drive member (10), said output spindle having a rear spindle portion (15) extending into said fluid chamber (12), said rear spindle portion (15) having two radial slots (18, 19) therein;

a radially movable seal element (21, 22) supported in each of said radial slots, respectively, for sealing cooperation with said seal lands (23, 24) on said fluid chamber wall (14);

first seal ridges (25, 26) on said rear spindle portion (15);

second seal ridges (28, 29) on said fluid chamber wall (14) for sealing cooperation with said first seal ridges (25, 26);

said fluid chamber (12) being divided into two high pressure compartments (H.P.) and two low pressure compartments (L.P.) during short intervals of the relative rotation between said drive member (10) and said output spindle (13) at simultaneous cooperation between said seal elements (21, 22) and said seal lands (23, 24) and said first seal ridges (25, 26) and said second seal ridges (27, 28), respectively;

said rear spindle portion (15) comprising a coaxial bore (35) and at least two radial passages (44-47) coupling said coaxial bore (35) to said fluid chamber (12) on both sides of said first seal ridges (25, 26);

a valve spindle (39) non-rotatively connected to said drive member (10) and rotatively supported in said bore (35) and including passage forming means (42, 43) for controlling communication of said radial passages (44-47) with said coaxial bore (35);

said rear spindle portion (15) comprising openings (33, 34) through which at least a part (31, 32) of each seal element (21, 22) extends; and

cam means (40), associated with said valve spindle (39) for engaging said part (31, 32) of each seal element (21, 22) and for positively urging said seal elements into contact with said fluid chamber wall (14).

4,884,996

ELASTIC COUPLING WITH SPRING GUIDES

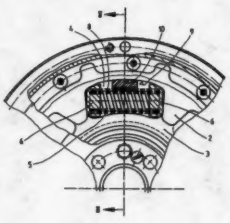
Manfred Schmitt, and Wolfgang Hanke, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Continuation of Ser. No. 105,869, Oct. 7, 1989, abandoned. This application Dec. 12, 1988, Ser. No. 282,910

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635043

Int. Cl.[4] F16D *3/12*

U.S. Cl. 464—68 **4 Claims**



1. An elastic coupling having disc-shaped coupling halves which rotationally interlock and having ports in which tangentially disposed helical compression springs are accommodated, each port having a radially outer abutment surface and each spring having a radially outer peripheral region, and

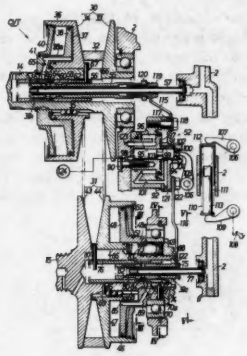
means including a sliding member loosely inserted in each port for keeping the respective spring straight, the sliding member being disposed between the radially outer peripheral region of the spring and the radially outer abutment surface of the port, the sliding member being freely displaceable on the radially outer peripheral region of the spring along the abutment surface, the sliding member being guided by a concave curvature in engagement with a respective spring, said curvature conforming to the diameter of the spring, and by the radially outer abutment surface of the respective ports in the coupling halves.

4,884,997

V-PULLEY FOR BELT TYPE CONTINUOUSLY VARIABLE TRANSMISSION

Torao Hattori, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 202,981
Claims priority, application Japan, Jun. 5, 1987, 62-86772[U]
Int. Cl.[4] F16H 11/02
U.S. Cl. 474—28 10 Claims



1. A V-pulley for a belt type continuously variable transmission, comprising a stationary pulley half fixedly mounted to a transmission shaft; a movable pulley half coupled slidably to the transmission shaft via a plurality of rows of ball keys and cooperating with the stationary pulley half to support a V-belt; a plurality of coil springs resiliently biasing the movable pulley half toward the stationary pulley half to impart an initial tension to the V-belt; a hydraulic operating device including a first hydraulic member fixedly mounted to the transmission shaft and a second hydraulic member disposed on the movable pulley half to define a hydraulic chamber with the first hydraulic member, wherein said first hydraulic member has a boss portion which is fitted and fixed to said transmission shaft, said boss portion being formed with a plurality of spring guide bores penetrating axially therethrough, said coil springs being accommodated in said spring guide bores and having fixed ends thereof supported by a pressing member which is secured to said transmission shaft, wherein said first hydraulic member is formed as a stationary piston and said second hydraulic member is formed as a hydraulic cylinder which accommodates therein said stationary piston, the hydraulic operating device being adapted to operate said movable pulley half by hydraulic pressure introduced into the hydraulic chamber; and a control valve for controlling supply of hydraulic pressure to the hydraulic operating device,

wherein, a plurality of guide grooves are provided on an outer periphery of the transmission shaft for guiding said plurality of rows of ball keys, and said coil springs are disposed at positions between the guide grooves.

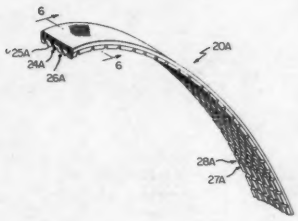
4,884,998

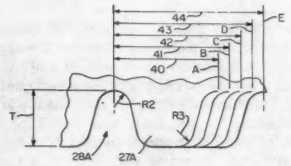
ENDLESS POWER TRANSMISSION BELT CONSTRUCTION AND METHOD OF MAKING THE SAME

Joseph P. Miranti, Jr., Nixa, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 152,693, Feb. 5, 1988, Pat. No. 4,832,670.
This application Mar. 17, 1989, Ser. No. 324,852
Int. Cl.[4] F16G 1/28
U.S. Cl. 474—205 10 Claims

1. In a method of making an endless power transmission belt construction having opposed side edge means and having an inner surface means defining a plurality of longitudinally disposed and alternately spaced apart projections and grooves for meshing with a ribbed surface means of a rotatable pulley means or the like and defining a plurality of transversely disposed and alternately spaced apart projections and grooves that respectively extend between and to said opposed side edge means, the improvement comprising the step of forming the longitudinal spacings between said transverse grooves to be staggered so as to tend to reduce noise during normal operation of said belt construction with said pulley means or the like, the step of forming causing said longitudinal spacings to comprise different lengths that are arranged in a random sequence of a certain number of said lengths with that sequence then being repeated throughout the length of said belt construction in the longitudinal direction thereof.





2. In an endless power transmission belt construction having opposed side edge means and having an inner surface means defining a plurality of longitudinally disposed and alternately spaced apart projections and grooves for meshing with a ribbed surface means of a rotatable pulley means or the like and defining a plurality of transversely disposed and alternately spaced apart projections and grooves that respectively extend between and to said opposed side edge means, the improvement wherein the longitudinal spacings between said transverse grooves are staggered so as to tend to reduce noise during normal operation of said belt construction with said pulley means or the like, said longitudinal spacings comprising different lengths that are arranged in a random sequence of a certain number of said lengths with that sequence then being repeated throughout the length of said belt construction in the longitudinal direction thereof.

4,884,999

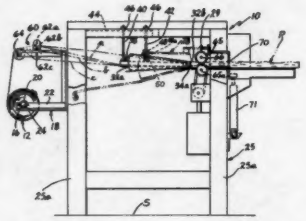
DUNNAGE CONVERTER FOR PRODUCING NARROW WIDTH CUSHIONING PAD PRODUCT, CONVERSION KIT THEREOF, AND METHOD

Bruno H. Baldacci, Novelty, Ohio, assignor to Ranpak Corp., Willoughby, Ohio

Filed Jan. 4, 1988, Ser. No. 140,734
Int. Cl.[4] B31F 1/10
U.S. Cl. 493—439 16 Claims

6. A converter mechanism for taking paper in stock roll form and converting it into a narrow width and small size pad-like cushioning product for use for instance, in packaging and comprising lateral juxtaposed portions which have been coined transversely thereof generally centrally and lengthwise of the

cushioning product, to maintain said portions in generally connected relation, and forming an elongated pad-like product, said converter mechanism comprising a frame, means on said frame for causing inward rolling of the lateral edges of the sheet-like stock material into generally rolled form, said means including a longitudinally extending converging funnel-like chute member and a coacting former member, extending lengthwise and interiorly of said chute member, the latter including a widened entrance end portion and relatively narrower exit end portion, means for rotatably mounting a multiply stock roll of the sheet-like material, for supplying the latter to the first mentioned means, and coining means on said frame disposed downstream from said chute member and adapted to receive from said exit end portion the generally abutting rolled edge sheet-like stock material between the bite of said coining



means and operable to connect the generally abutting rolled edge stock material into pad-like cushioning dunnage product form, said coining means being operable to pull the sheet-like stock material from the stock roll through said chute member and past said former member, and to coin the inwardly rolled edge stock material for the major portion of the transverse dimension of the pad-like product, thereby forming the product with a lengthwise extending generally central coined portion and lateral non-coined edge portions extending lengthwise of the product, said former member comprising an elongated generally rectangular shaped, in plan, bar having its forward end positioned generally adjacent said exit end portion of said chute member and its rearward end extending rearwardly of said entrance and end portion of said chute member, said former member extending lengthwise of said chute member along the vertical longitudinal center plane of said chute member.

4,885,000

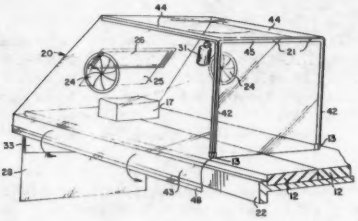
ISOLATION, STERILIZATION AND MAXIMUM OBSERVATION TENT

John D. Hogan, Gloucester, Mass., assignor to The Beth Israel Hospital Association, Boston, Mass.

Continuation-in-part of Ser. No. 1,648, Jan. 9, 1987, abandoned. This application Jan. 8, 1988, Ser. No. 142,077

Int. Cl.[4] A61M *16/02*

U.S. Cl. 600—21 **10 Claims**



1. An isolation, sterilization and maximum observation apparatus for examination of a corpse resting on a table or support comprising:

(a) a frame;

(b) a disposable tent, having a plurality of sides supported by said frame, fabricated of transparent, air-tight material comprising:

(i) means located on said tent to access the interior of said tent while preventing the escape of any materials within said tent;

(ii) means located on said tent and in communication with the interior of said tent to decontaminate air-born, ambient, contagious particles located within said tent;

(ii) a sealable disposable bag located along an edge of a base of said tent extending substantially along the length of one of said plurality of sides in which said tent and frame may be collapsed and contained therein said disposable bag being sanitarily sealable; and

(iv) liquid sealing means, secured on said tent, positioned so that when said tent is draped over the table said liquid sealing means is pulled tightly against the table or support.

4,885,001

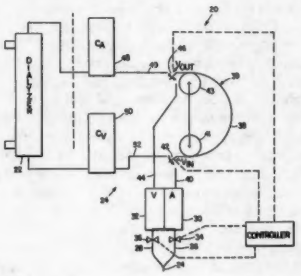
PUMP WITH PLURAL FLOW LINES

Lawrence L. Leppert, Littleton, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Jun. 3, 1988, Ser. No. 202,106

Int. Cl.[4] A61M *1/03*

U.S. Cl. 604—4 **21 Claims**



1. Apparatus for pumping fluid through plural flow lines comprising

a pump having an inlet and an outlet for transporting said fluid therethrough,

first and second flow lines that are selectively connectable to said pump inlet via a first valve, and

third and fourth flow lines that are selectively connectable to said outlet via a second valve,

said first and third lines being inflow and outflow lines, respectively,

said second and fourth lines being connected to a fluid flow transfer device.

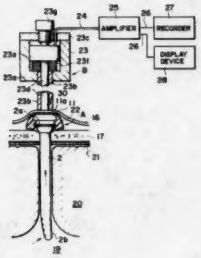
whereby said pump can be used to selectively pump fluid through different flow paths.

4,885,002

BRAIN VENTRICLE SHUNT SYSTEM

Yasuo Watanabe, Komae; Kenichi Yamakoshi, Sapporo, and Hideaki Shimazu, Tokyo, all of Japan, assignors to Kabushiki Kaisha Nihon M.D.M., Tokyo, Japan

Filed Oct. 27, 1987, Ser. No. 114,192
Claims priority, application Japan, Nov. 4, 1986, 61-262162
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—9 11 Claims



1. A system for measuring the pressure of cerebrospinal fluid in a brain ventricle of a patient, comprising:

first means implantable beneath the scalp of a patient and extending into a brain ventricle of the patient for receiving therein cerebrospinal fluid under pressure from the brain ventricle, the first means having means defining a reservoir for receiving the cerebrospinal fluid, the reservoir having flexible portion which expands outwardly when the reservoir is filled with the cerebrospinal fluid; and

second means for exerting, through the patient's scalp, an inward force on the reservoir flexible portion of a magnitude sufficient to flexibility compress the reservoir flexible portion inwardly a predetermined extent and for measuring the pressure of the cerebrospinal fluid in the brain ventricle according to the magnitude of the inward force.

4,885,003

DOUBLE MESH BALLOON CATHETER DEVICE

Richard A. Hillstead, Hollywood, Fla., assignor to Cordis Corporation, Miami, Fla.

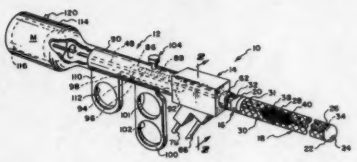
Filed Jul. 25, 1988, Ser. No. 223,869
Int. Cl.[4] A61B *17/32*
U.S. Cl. 604—22 25 Claims

1. A double mesh balloon catheter device comprising:

a catheter having a proximal end and a distal end;

a double tubular mesh assembly having a proximal end and a distal end, being mounted to the distal end of said catheter and comprising an outer tubular mesh and an inner tubular mesh; and

actuating means coupled to the proximal end of the catheter and extending thorough the catheter to the double tubular



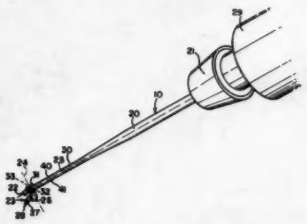
mesh assembly for moving the distal end thereof to effect axial contraction of the double tubular mesh assembly.

4,885,004

ROTATING STYLUS CYSTITOME

David S. C. Pao, 95 Highpoint Dr., Churchville, Pa. 18966

Continuation of Ser. No. 114,117, Oct. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 83,897, Aug. 6, 1987, Pat. No. 4,766,896, which is a continuation of Ser. No. 822,122, Jan. 24, 1986, abandoned. This application Apr. 25, 1989, Ser. No. 344,414
Int. Cl.[4] A61B *17/32*
U.S. Cl. 604—22 17 Claims



1. A rotating stylus cystitome comprising:

(a) an elongated rigid shaft having a central longitudinal axis and an end portion with an aperture transversely disposed therethrough, said end portion having a substantially planar surface disposed on a surgically superior surface of said shaft substantially perpendicularly to a central axis of said aperture; and

(b) a cutting member comprising a swivel portion rotatably mounted to said shaft through said aperture and an outwardly facing knife portion laterally disposed from said swivel portion, said swivel portion comprising a superior end disposed to slide against said substantially planar surface to provide smoother rotation to said cutting member as it rotates on the shaft;

said cutting member further comprising a heel portion extending in a surgically inferior direction further from said central longitudinal axis than at least a portion of said knife portion.

4,885,005

SURFACTANT TREATMENT OF IMPLANTABLE BIOLOGICAL TISSUE TO INHIBIT CALCIFICATION

Aws S. Nashef, Costa Mesa, and Ahmed I. Ahmed, Riverside, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 711,883, Mar. 15, 1985, abandoned, which is a division of Ser. No. 441,023, Nov. 12, 1982, abandoned. This application Feb. 27, 1987, Ser. No. 20,202

Int. Cl.[4] A61F *1/22*

U.S. Cl. 8—94.11 12 Claims

1. A method for reducing calcification of soft biological tissue after implantation in an animal comprising:

chemically fixing the biological tissue under tissue fixing conditions; and

contacting the fixed biological tissue with a solution of a nonionic surfactant prior to implantation wherein the amount of surfactant in the solution is from about 0.1 to about 10 weight percent in an amount effective in reducing calcification of the tissue after implantation.

4,885,006

PROCESS FOR DYEING KERATINOUS FIBRES WITH INDOLE DERIVATIVES COMBINED WITH AN IODIDE

Jean F. Grollier, Paris, and Didier Garoche, Levallois-Perret, both of France, assignors to L'Oreal, Paris, France

Filed Nov. 17, 1987, Ser. No. 121,890

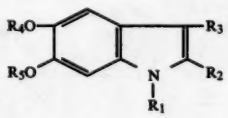
Claims priority, application Luxembourg, Nov. 17, 1986, 86668

The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.

Int. Cl.[4] A61K *7/13*

U.S. Cl. 8—423 21 Claims

1. A process for dyeing human keratinous fibers comprising applying to said fibers at least one composition (A) comprising, in a cosmetically acceptable medium at least one indole derivative having the formula



(I)

wherein

R_1 represents hydrogen, C_1–C_6 lower alkyl or $-SiR_9R_{10}R_{11}$,

R_2 and R_3, each independently, represent hydrogen, C_1–C_6 lower alkyl, carboxyl, lower alkoxycarbonyl wherein the alkoxy moiety contains 1–6 carbon atoms or $-COO-SiR_9R_{10}R_{11}$,

R_4 and R_5, each independently, represent hydrogen, C_1–C_{20} linear or branched alkyl, formyl, linear or branched C_2–C_{20} acyl, linear or branched C_3–C_{20} alkenoyl, $-SiR_9R_{10}R_{11}$, $-P(O)(OR_6)_2$ or R_6OSO_2-, or R_4 and R_5 together with the oxygen atoms to which they are attached form a ring containing or not a carbonyl group, a methylene group, a thiocarbonyl group, a $>P(O)OR_6$ group or a $>CR_7R_8$ group,

R_6 and R_7 represent hydrogen or C_1–C_6 lower alkyl,

R_8 represents C_1–C_6 lower alkoxy, monoalkylamino wherein the alkyl moiety has 1–6 carbon atoms or dialkylamino wherein the alkyl moiety has 1–6 carbon atoms,

R_9, R_{10} and R_{11}, each independently, represent C_1–C_6 linear or branched alkyl,

with the proviso that at least one of R_1–R_5 is other than hydrogen,

the inorganic or organic acid addition salts of said indole and the corresponding alkali metal, alkaline earth metal and amine salts thereof,

said indole being present in an amount ranging from 0.01 to 5 percent by weight based on the total weight of said composition, and

(a) an iodide present in an amount ranging from 0.007 to 4 percent by weight based on the total weight of said composition and expressed as iodide ions, or

(b) a solution of hydrogen peroxide at a concentration of 1–40 volumes, said composition (A) having a pH ranging from 3.5 to 7 when said cosmetically acceptable medium is water or a water solvent mixture,

said composition (A) being applied to said human keratinous fibers either prior to or subsequent to the application to said keratinous fibers of a composition (B) comprising, in a cosmetically acceptable medium, (i) hydrogen peroxide solution at a pH ranging from 2 to 7 when said composition (A) contains said iodide, or (ii) said iodide when said composition (A) contains hydrogen peroxide.

4,885,007

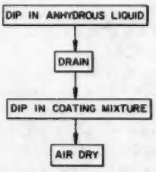
DIP PROCESS FOR ENVELOPING A BATTERY PLATE

Paul C. Wegner, San Carlos, Calif., assignor to Tiegel Manufacturing, Belmont, Calif.

Filed Aug. 1, 1988, Ser. No. 226,457

Int. Cl.[4] H07M *2/18*

U.S. Cl. 29—623.5 18 Claims



1. An improved method of enveloping a battery plate with a commercially acceptable separator material, comprising the steps of:

a. displacing air and water from the plate by dipping in a first liquid comprising an anhydrous solvent;

b. thereafter dipping the plate in a second liquid comprising a polymer dissolved in an anhydrous solvent/nonsolvent mixture and a filler in suspension; and then

c. removing the plate and allowing the anhydrous solvent-/nonsolvent to evaporate and form, about said plate, an envelope of microporous separator material.

4,885,008

METHOD FOR IMPROVING COLD FLOW OF HYDROCARBON FUEL OILS

Takaharu Ishizaki; Taizo Igarashi, both of Nishinomiya City; Yasuo Urano, Amagasaki City, and Yumiko Onodera, Nishinomiya City, all of Japan, assignors to Nippon Oil and Fats Company, Limited, Japan

Filed Jan. 23, 1989, Ser. No. 299,412

Claims priority, application Japan, Jan. 26, 1988, 63-14948

Int. Cl.[4] C10L *1/22*

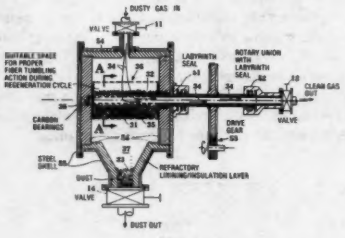
U.S. Cl. 44—62 10 Claims

1. A method for improving low temperature cold flow of fuel oils comprising a cross-linked ester compound consisting essentially of a nitrogen-containing compound having hydroxyl group, a straight chain saturated fatty acid, and a cross-linking agent to said fuel oils.

4,885,009
COAXIAL SCREEN FILTER

William R. Schneider, Athens, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Nov. 9, 1988, Ser. No. 269,203
Int. Cl.[4] B01D 46/04
U.S. Cl. 55—96 15 Claims



1. A method for removing a pollutant such as dust from a fluid stream comprising

providing a nested array of fibers in a substantially annular container having openings in its inner and outer cylindrical sides of such size as to retain the fibers within the container while permitting fluid to pass through easily,

passing the pollutant-containing fluid stream through at least a substantial portion of the container from a region outside the outer side to a region inside the inner side,

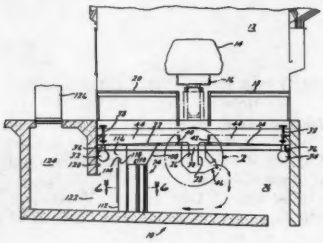
separating a substantial fraction of the pollutant from the fluid stream in a portion of the nested array generally nearer to the outer side of the container than to the inner side, and

rotating the container about its axis from time to time to remove a substantial fraction of the separated pollutant from the nested array by tumbling action and by the force of gravity through the openings in the outer side of the container.

4,885,010
SPRAY BOOTH

Douglas A. Rich, Detroit; Paul N. Rick, Plymouth; James N. Bournias, Grosse Pointe Shores, and Robert E. Lyons, Northville, all of Mich., assignors to Gallagher-Kaiser Corporation, Detroit, Mich.

Filed Oct. 3, 1988, Ser. No. 252,893
Int. Cl.[4] B01D 47/00
U.S. Cl. 55—241 12 Claims



1. A gas scrubber comprising:

an enclosure including gas inlet means and outlet means;

means defining a first chamber within said enclosure, said first chamber having liquid inlet means;

means defining a second chamber within said enclosure and disposed adjacent said first chamber, said second chamber including liquid outlet means;

a throat defining an opening between said first chamber and said second chamber for allowing a gas containing entrained particulate matter and a liquid to flow from said first chamber to said second chamber;

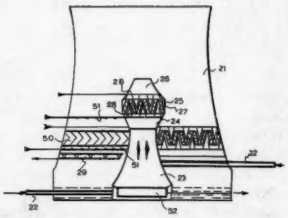
trough means disposed in intercepting relationship with respect to the flow of said gas and said liquid through said throat, said trough means being operative to retain a reservoir of said liquid, the surface of said liquid within said reservoir cooperating with a wall portion extending from said throat to define a first constriction and said trough further including means cooperating with wall means for defining a second constriction spaced from said first constriction; and

means for causing a pressure differential between said first and second chambers whereby said gas and said liquid are caused to flow from said first chamber into said second chamber, said first and second constrictions being operative to effect atomization of said liquid and mixing of said liquid and said gas for scrubbing particulate matter from said gas.

4,885,011
COOLING TOWER FOR THE COOLING WATER THAT DRAINS/ FROM THE CONDENSOR OF A STEAM GENERATOR OR THE CONDENSORS/ OF A PLURALITY OF STEAM GENERATORS

Sigurd Jorzyk, Saarbrücken; Gerhard Scholl, Spiesen-Elversberg; Heinz Hölter, Gladbeck; Heinrich Igelbüscher, both of Gladbeck; Heinrich Gresch, Dortmund-Wickede, and Heribert Dewert, Gladbeck, all of Fed. Rep. of Germany, assignors to Saarbergwerke Aktiengesellschaft, Saarbrucken, Fed. Rep. of Germany

Division of Ser. No. 937,204, Nov. 13, 1986, Pat. No. 4,784,810.
This application Apr. 8, 1988, Ser. No. 179,655
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509542; Mar. 16, 1985, 3509543
Int. Cl.[4] B01F 3/04
U.S. Cl. 55—242 1 Claim



1. A cooling tower for condenser water from a steam power plant, comprising:

a cooling tower body centered on an upright axis, said cooling tower body being formed with a peripheral wall including a lower portion having a first diameter and an upper outlet portion having a second diameter less than said first diameter, said wall having an intermediate portion between said lower portion and said outlet portion of said tower, said peripheral wall being continuously tapered at least up to said intermediate portion of said cooling tower;

a first trap disposed in said lower portion of said tower and extending over substantially an entire cross section thereof for collecting solids precipitating from condenser water upon the mixing thereof with the cooling air, said first trap having an upstream and downstream sides;

a first array of supplied nozzles with a wash water disposed at the upstream and downstream sides of said first trap;

a smoke-gas feed connected to said tower and formed with at least one gas outlet pipe centered on said upright axis and extending above said trap for introducing wet-cleaned smoke gas into the flow of rising air through a free end of said gas outlet pipe, said free end of the gas outlet pipe being formed with a first part having a substantially frustoconical cross-section widening toward said outlet portion of said cooling tower, a second part having a first substantially cylindrical cross-section above said first part and an outlet part forming said free end of the outlet gas pipe line and tapered toward said axis;

a second droplet trap having respective upstream and downstream sides in said second part of said gas outlet pipe for separating droplets from said wet-cleaned gas;

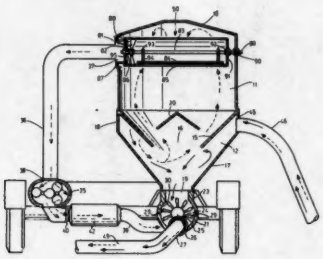
another array of nozzles for spraying wash water provided in said second part of said gas outlet pipe and disposed at the respective upstream and downstream sides of said second trap; and

a collector provided below said first trap for removal of wash water from said first and second traps.

4,885,012
ROTARY SCREEN FOR PNEUMATIC GRAIN HANDLING

Andy L. Thompson, R.R. 1, Courtland, Kans. 66939

Filed Jan. 17, 1989, Ser. No. 296,935
Int. Cl.[4] B81D *50/00*; B65G *53/40*
U.S. Cl. 55—290 **14 Claims**



1. A pneumatic conveyance apparatus for moving granular matter, comprising:

an enclosed container having a lower cyclone portion and an upper portion defined by an internal partition having an aperture therethrough allowing communication between the portions, said container having at least one inlet for sucking air and granular matter into the lower cyclone portion, and having an outlet for exhausting air from the upper portion;

valve and duct means for conveying granular matter collected in the lower cyclone portion therefrom;

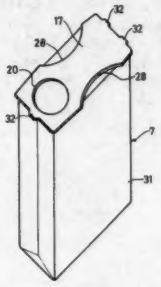
a blower connected between the container outlet and the valve and duct means for creating a partial vacuum in the container and an elevated pressure at the valve and duct means; and

a rotary screen assembly provided in the upper portion of the container for removing airborne particles from the air leaving the container and entering the blower, said screen assembly comprising a generally cylindrical shaped perforated screen member rotatably mounted with respect to the container, said screen member supported by an elongated shaft member, a propeller means operatively connected to the screen member, said propeller means located in the airstream at the outlet of the container and rotatively driven by said airstream, whereby rotary motion is imparted to the screen member, said airstream passing through perforations in the screen member radially inwardly.

4,885,013
ARRANGEMENT OF FILTER BAGS IN ELECTRIC VACUUM CLEANERS

Heinz-Jürgen Ahlf, Bergisch/Gladbach; Gieland Gühne, Remscheid, and Manfred Eckhart, Wuppertal, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,559
Claims priority, application Fed. Rep. of Germany, May 4, 1987, 3714773
Int. Cl.[4] A47L *9/14*
U.S. Cl. 55—367 **15 Claims**



1. A vacuum cleaner system comprising:

a removable filter bag having an enclosing wall and a bottom plate secured to said wall;

a chamber containing said bag, said chamber having an entrance for removably inserting said bag into the chamber;

a motor-fan housing for directing air flow through said chamber; and

support means located at said chamber entrance for engagement with said bottom plate of said bag to support said bag, said support means having conduit means for guiding air into said bag, the bottom plate of said bag having an opening for engagement with said conduit means; and wherein

said bottom plate has a first side-edge indentation and a second side-edge indentation disposed opposite said first side-edge indentation; and

said support means has projections extending into both said indentations and protruding beyond a side of said bottom plate to contact said wall.

4,885,014
APPARATUS FOR FILTERING GASES

Erich Reinhardt, Bietigheim-Bissingen, and Rainer H. Schubert, Crailsheim, both of Fed. Rep. of Germany, assignors to Schumacher'sche Fabrik GmbH & Co. KG, Crailsheim, Fed. Rep. of Germany

PCT No. PCT/DE86/00223, § 371 Date Mar. 15, 1988, § 102(e) Date Mar. 15, 1988, PCT Pub. No. WO87/07180, PCT Pub. Date Dec. 3, 1987
PCT Filed May 30, 1986, Ser. No. 162,317
Int. Cl.[4] B01D *46/24*
U.S. Cl. 55—484 **3 Claims**

1. Apparatus for filtering gases comprising a closed container which is divided by a horizontal perforated plate into a lower compartment provided with a gas inlet and an upper compartment provided with a gas outlet, tubular or candle-shaped filter elements which are sealingly suspended in holes of the perforated plate and are supported by a flange-type

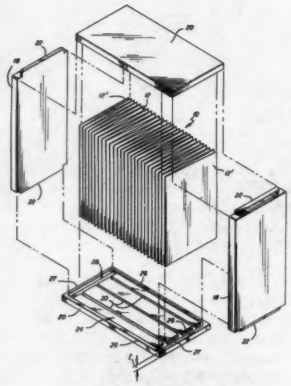
enlargement at their upper end on the perforated plate, wherein the flange-type enlargement forms a bearing surface which lies on the surface of a sphere with center point above the bearing surface and on the vertical center axis of the filter element, and wherein the hole in the perforated plate so surrounds at a distance the filter shell of the filter element downwardly adjoining the enlargement that the filter element can swivel over a certain angular range about the center point of the sphere, and stops provided at the bottom of the filter element for limitation of the swivel motion of the filter element, said stops formed by a vertical limiting element which is stationarily arranged in the lower compartment and dips upwardly with play into a downwardly open cavity in a filter element suspended above the vertical limiting element.

4,885,015

HEPA AIR FILTER FOR HIGH TEMPERATURE ENVIRONMENTS AND METHOD OF FABRICATION

Roger Goulet, Jamestown, R.I.; Joseph Cutri, Syracuse, and Joseph DeYulio, Baldwinsville, both of N.Y., assignors to Cambridge Filter Corporation, Syracuse, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,649
Int. Cl.[4] B01D *27/06, 27/08*
U.S. Cl. 55—497 **26 Claims**



1. An air filter assembly comprising:

(a) a filter core including a unitary sheet of air-permeable media folded in accordion fashion to form a plurality of side-by-side pleats with zig-zag edges on two opposite sides and flat panels on the other two sides, and a spacer member between opposing walls of successive pleats; and

(b) a box-like frame enclosing said media on four sides in air tight engagement to define an air flow opening extending between upstream and downstream sides on said assembly, said frame comprising:

(i) an essentially identical pair of substantially rectangular sides casings, each having a length L, a width W and a thickness T;

(ii) a tenon at each end of said side casings, each of said tenons having a length L', a width W' and a thickness T';

(iii) an essentially identical pair of substantially rectangular end casings, each having a length l, a width w and a thickness t;

(iv) a recess formed in one major surface of each of said end casings inwardly of the peripheral edges thereof, said recess extending into said major surface to a substantially uniform depth d and being bounded on each side by walls comprising marginal edge portions of the end casing in which it is formed and on each end by an area extending into said major surface to a substantially uniform depth D' from said major surface, depth D' being greater than depth d; and

(v) a plurality of grooves having upper sides communicating with said recess and lower sides at a substantially uniform depth D from said major surface, depth D being greater than depth d, said grooves communicating at each end with said areas; and

(c) means sealing outwardly facing surfaces of said media panels to opposing, inwardly facing surfaces of said side casings in airtight engagement, said zig-zag media edges being positioned in said recesses and said tenons on said side casings being positioned in said areas at opposite ends of said recesses, thereby forming a mortise-type joint between said side and end casings; and

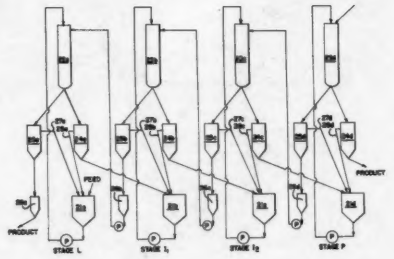
(d) a solid adhesive material within each of said recesses, areas and grooves of said end casings, whereby said zig-zag media edges and said tenons are encased in said adhesive material.

4,885,016

MULTISTAGE FRACTIONAL FREEZING FOR SUPERPURIFYING CRYSTALLIZABLE SUBSTANCES

Kenneth F. Griffiths, 415 Whitewater Ave., Fort Atkinson, Wis. 53538

Filed Aug. 31, 1988, Ser. No. 238,917
Int. Cl.[4] B01D *9/04;* C02F *1/22*
U.S. Cl. 62—532 **24 Claims**



1. A method for superpurifying crystallizable substances by a multistage recrystallization fractional freezing procedure which includes controlling reflux ratio conditions, the method comprising:

combining a crystallizable substance with a mother liquor thereof to form a new solution, said combining step occurring within a plurality of collectors of a plurality of respective stages, one of which is a collector of a least pure stage and another of which is a collector of a purest stage;

lowering the temperature of the new solution of each said stages to a freezing temperature at which the crystallizable substance crystallizes in order to form frozen crystals with mother liquor in each said stage;

separating said mother liquor from the frozen crystals of each said stage, the mother liquor being in a mother liquor receiver of each said stage;

transferring a controlled quantity of said mother liquor of each stage, said transferring of the controllable quantity of mother liquor from the least pure stage provides a controlled quantity of byproduct, and said transferring of the controllable quantity of mother liquor from the stages other than said least pure stage is for said step of combining to form the new solution of each said stage;

melting at least a portion of said frozen crystals to form a quantity of melted crystals;

transferring a controlled quantity of said melted crystals of each stage, except for the purest stage, to the collector of

the next more pure stage for subsequent processing in said combining step of each said next more pure stage;

collecting the separated crystals of the purest stage as a controlled quantity of superpurified crystal product;

adding a controlled quantity of crystallizable substance as feed to the collector of the least pure stage; and

controlling the reflux ratio of the multistage recrystallization fractional freezing procedure.

4,885,017

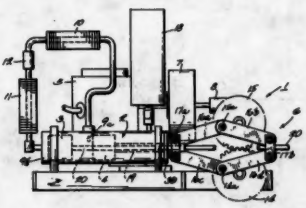
HEAT TRANSFER UNIT

Dale Fleischmann, P.O. Box 763, Wausau, Wis. 54401

Filed Sep. 3, 1987, Ser. No. 92,562

Int. Cl.[4] F25B *9/00*

U.S. Cl. 62—6 **10 Claims**



1. Apparatus operable in alternative modes to heat or cool the ambient air in a nominally interior space, comprising:

a power piston and a displacer piston arranged coaxially in said cylinder for moving toward and away from each other between said ends,

a drive mechanism and means including reversible motor means for actuating said drive mechanism, said motor means being operated in different rotational directions for the heating and cooling modes, said displacer and power pistons being coupled to said drive mechanism for being moved axially in said cylinder in a cyclical predetermined relationship with each other,

a first heat exchanger over which air in said interior space flows for transferring heat to said air in said interior space when the apparatus is operating in the heating mode and to absorb heat from said air when said apparatus is operating in the cooling mode, said first heat exchanger having a port in gas flow communication with a space between said pistons,

a second heat exchanger over which air in a nominally exterior space flows to absorb heat from said air when said apparatus is operating in the heating mode and to transfer heat to said exterior air when said apparatus is operating in the cooling mode, said second heat exchanger having a port in gas flow communication with a space between one end of said cylinder and said displacer piston, and

means including a regenerative device for coupling said heat exchangers in series so as to provide a closed gas flow path between said space between said cylinder end and displacer piston and said space between pistons.

4,885,018

METHOD FOR MANUFACTURING ROTATIONALLY SYMMETRICAL POROUS SOLID BODIES

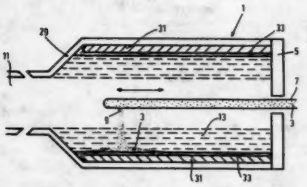
Peter K. Bachmann; Peter E. Geittner, both of Aachen; Hans-Jürgen Lydtin, Stolberg, and Gerd Romanowski, Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jan. 22, 1988, Ser. No. 146,888

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702025

Int. Cl.[4] C03B *37/016*

U.S. Cl. 65—3.11 **18 Claims**



1. A method of manufacturing rotationally symmetrical porous solid bodies which comprises the steps of: providing a suspension comprising the starting material for the solid body in solid form and a liquid dispersing agent; introducing said suspension into a hollow mold whose geometry corresponds to that of the solid body to be formed while rotating the hollow mold about its longitudinal axis, thereby depositing solid of the suspension on the inner wall of the hollow mold, and removing the excess residual suspension after which the green body thus formed is subjected to further process steps to manufacture the solid body, wherein the suspension is continuously and consecutively introduced into the hollow mold by means of a feeding device which is movable over the full length of the inner wall of the hollow mold and effective to introduce said suspension in such doses that a thin solid layer having a thickness in the range from 10^{-3} to 5 mm is continuously and consecutively deposited without interruption of the centrifuging process, and, after the deposition of each solid layer, excess residual suspension having a density that is less than that of the suspension is continuously and consecutively removed from the hollow mold in an amount sufficient to deposit on said thin solid layer, a layer of residual suspension having a thickness in the range from 10^{-1} to 100 mm.

4,885,019

PROCESS FOR MAKING BULK HEAVY METAL FLUORIDE GLASSES

Joseph J. Hutta, Groton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 28, 1988, Ser. No. 149,458

Int. Cl.[4] C03B *37/027*

U.S. Cl. 65—3.11 **2 Claims**

1. A process of manufacturing a bulk heavy metal fluoride glass having minimal carbon dioxide therein, said process comprising the steps of:

obtaining constituent fluoride compounds of said heavy metal fluoride glass in as pure a form as possible:

weighing each of said compounds to obtain a desired composition of said heavy metal fluoride glass;

mixing said compounds together to form said desired composition;

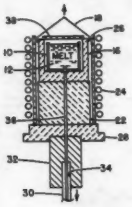
forming a charge of said composition;

loading a crucible with said charge;

placing said crucible in a furnace enclosure;

placing a material having high oxygen affinity in proximity to the crucible;

sealing said furnace;
filling said furnace with air;
quickly raising a temperature of said charge above said fusion temperature to insure admixture of molten constitutent compounds of said charge;
reducing the partial pressure of oxygen in said furnace at a level ranging from approximatey 10^{-7} to 10^{-40} atmospheres in the 800° C. to 1000° C. temperature range to minimize carbon dioxide contamination of said charge;



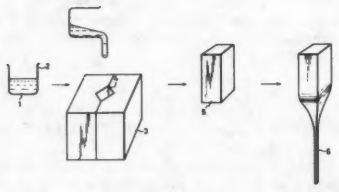
holding said charge at this higher temperature within said range for a short period of time, said charge reaching said higher temperature in less than two hours from the start of said heating; and
lowering a temperature of said charge in a short period of time to a temperature less than said fusion temperature, said charge forming a bulk glass.

4,885,020

METHOD OF MANUFACTURING GLASS FIBER

Atsushi Nishino; Yasuo Mizuno, and Masaki Ikeda, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 4, 1988, Ser. No. 152,202
Claims priority, application Japan, Feb. 5, 1987, 62-25118; Feb. 5, 1987, 62-25120
Int. Cl.[4] C03B *37/00*
U.S. Cl. 65—2 **10 Claims**



1. A method of manufacturing a glass fiber, comprising the steps of:
(a) pouring melted glass into a slit defined by two halves of a dividable mold, the slit having a polygonal cross-sectional shape of a thickness 5 to 20 times larger than a finally required thickness of the glass fiber;
(b) cooling the glass poured into the polygonal slit;
(c) removing said dividable mold from said glass to obtain a preform having said polygonal cross-sectional shape;
(d) drawing said preform with said preform being heated to a temperature 100° to 150° C. higher than a softening point of said glass so as to obtain a glass fiber having said polygonal cross-sectional shape; and
(e) cooling said glass fiber having said polygonal cross-sectional shape.

4,885,021

PARTICULATE UREA WITH CLAY INCORPORATED FOR HARDNESS AND/OR GELLING

Jimmie L. Elrod, Killen, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Feb. 22, 1988, Ser. No. 158,810
Int. Cl.[4] C05C *9/00*
U.S. Cl. 71—28 **18 Claims**

1. An improvd product resulting from the production of hard, free-flowing, storage-stable particulate urea, each particle thereof being substantially homogeneous, being substantially white in color, and consisting essentially of an admixture of urea and a gelling-type channelized 2:1 clay mineral, the quantity of said clay mineral ranging from about 0.05 percent to about 5.0 percent by weight of said admixture.

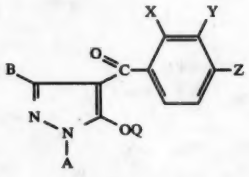
4,885,022

HERBICIDAL PYRAZOLE DERIVATIVES

Masatoshi Baba, Wako; Takuya Kakuta; Norio Tanaka, both of Funabashi; Eiichi Oya, Narashino; Takashi Ikai, Tokyo; Tsutomu Nawamaki, Yono, and Shigeomi Watanabe, Omiya, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 122,366
Claims priority, application Japan, Mar. 17, 1987, 62-61937; Jul. 17, 1987, 62-179797; Sep. 30, 1987, 62-247601
Int. Cl.[4] C07D *231/36, 231/20*; C07F *7/10*; A01N *43/56*
U.S. Cl. 71—86 **5 Claims**

1. A pyrazole derivative having the formula:



(I)

wherein A is an alkyl group having from 1 to 3 carbon atoms, an alkenyl group having from 2 to 4 carbon atoms or an alkynyl group having from 2 to 4 carbon atoms; B is a hydrogen atom, an alkyl group having from 1 to 3 carbon atoms, a halogen atom, a haloalkyl group having from 1 to 3 carbon atoms, an alkoxy group having from 1 to 3 carbon atoms, an alkylthio group having from 1 to 3 carbon atoms, an alkoxyalkyl group having from 2 to 4 carbon atoms, an alkylthioalkyl group having from 2 to 4 carbon atoms or an alkoxycarbonyl group having from 2 to 4 carbon atoms; X is an alkyl group having from 1 to 6 carbon atoms, an alkoxy group having from 1 to 6 carbon atoms, a halogen atom, a nitro group, a cyano group, a haloalkyl group having from 1 to 6 carbon atoms, an alkoxyalkyl group having from 2 to 6 carbon atoms, an alkylcarbonyl group having from 2 to 6 carbon atoms, an alkoxy group having from 2 to 6 carbon atoms, an aminocarbonyl group substituted independently by hydrogen or alkyl having from 1 to 6 carbon atoms, a haloalkoxy group having from 1 to 6 carbon atoms, an alkylthio group having from 1 to 6 carbon atoms or an alkylthioalkyl group having from 2 to 6 carbon atoms; Y is a —COOR1 group (wherein R1 is a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms, a cycloalkyl group having from 3 to 8 carbon atoms, a cycloalkylalkyl group having from 4 to 8 carbon atoms, an alkynyl group having from 3 to 6 carbon atoms, an alkenyl group having from 2 to 6 carbon atoms, a haloalkyl group having from 1 to 6 carbon atoms, a halocycloalkyl group having from 3 to 8 carbon atoms, a haloalkynyl group having from 3 to 6 carbon atoms, a haloakenyl group having from 2 to 6 carbon atoms or a phenyl group which may be substituted by alkyl having from 1 to 3 carbon atoms, halogen, nitro or alkoxy having from 1 to 3 carbon atoms), a —COO—L—OR1 group (wherein L is an alkylene group having from 1 to 6 carbon atoms which may be

substituted by alkyl having from 1 to 3 carbon atoms, and R1 is as defined above), a —COO—L—R2 group (wherein L is as defined above, and R2 is a phenyl group which may be substituted by alkyl having from 1 to 3 carbon atoms, halogen, nitro or alkoxy having from 1 to 3 carbon atoms), a COO—L—O—L—R2 group (wherein L and R2 are as defined above), a —COO—L—S(O)$_n$—R1 group (wherein L and R1 are as defined above, and n is an integer of from 0 to 2), a —CON(R3)(R4) group (wherein each of R3 and R4 is a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms, a cycloalkyl group having from 3 to 8 carbon atoms, a cycloalkylalkyl group having from 4 to 8 carbon atoms, an alkoxy group having from 1 to 6 carbon atoms, an alkynyl group having from 2 to 6 carbon atoms, an alkenyl group having from 2 to 6 carbon atoms, a haloalkyl group having from 1 to 6 carbon atoms, a halocycloalkyl group having from 3 to 8 carbon atoms, a haloalkynyl group having from 2 to 6 carbon atoms, a haloalkenyl group having from 2 to 6 carbon atoms or a phenyl group which may be substituted by alkyl having from 1 to 3 carbon atoms, halogen, nitro or alkoxy having from 1 to 3 carbon atoms, —COO—L—N(R3)(R4) group (wherein L, R3 and R4 are as defined above), a —COO—L—CO—R1 group (wherein L and R1 are as defined above), a —COO—L—CO—O—R1 group (wherein L and R1 are as defined above), a —COO—L—CN group (wherein L is as defined above), a —COO—L—NO_2 group (wherein L is as defined above), a —COOSi(R5)$_3$ group (wherein R5 is as defined above), a —COO—N=C(R6)(R7) group (wherein each of R6 and R7 which may be the same or different is an alkyl group having from 1 to 3 carbon atoms), a —COO—N=C—$(CH_2)_n$ group (wherein n is an integer of from 4 to 6), a —COO—L—O—SO_2—R1 group (wherein L and R1 are as defined above), a —COO—L—O—CO—R1 group (wherein L and R1 are as defined above, a —COO—L—O—L—O—R1 group (wherein L and R1 are as defined above), a —COO—L—Si(R5)$_3$ group (wherein L and R5 are as defined above); Z is a halogen atom, a nitro group, an alkoxy group having from 1 to 3 carbon atoms, a trifluoromethyl group, a cyano group or a —S(O)$_n$R10 group (wherein R10 is an alkyl group having from 1 to 3 carbon atoms or a haloalkyl group having from 1 to 3 carbon atoms, and n is an integer of from 0 to 2); Q is a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms which may be substituted by halogen, an alkenyl group having from 1 to 6 carbon atoms which may be substituted by halogen, an alkynyl group having from 1 to 6 carbon atoms which may be substituted by halogen, a cyanomethyl group, a —C(O)—R11 group (wherein R11 is a phenyl group which may be substituted by the same or different substituents selected from the group consisting of alkyl having from 1 to 6 carbon atoms, alkenyl having from 1 to 6 carbon atoms, alkynyl having from 1 to 6 carbon atoms, haloalkyl having from 1 to 6 carbon atoms, haloalkenyl having from 1 to 6 carbon atoms, haloalkynyl having from 1 to 6 carbon atoms, halogen, nitro and trifluoromethyl, an alkyl group having from 1 to 6 carbon atoms, an alkoxy group having from 1 to 6 carbon atoms or a hydroxyl group), a —S(O)$_2$R11 group (wherein R11 is as defined above), a —P(O)(OR11)$_2$ group (wherein R11 is as defined above), a —L—C(O)—R11 group (wherein L and R11 are as defined above), a —L—C(O)—N(R12)(R13) (wherein L is as defined above, each of R12 and R13 is a hydrogen atom or an alkyl group having from 1 to 6 carbon atoms), a —L—R14 group (wherein L is as defined above, R14 is a different substituents selected from the group consisting of halogen, nitro and trifluoromethyl, an alkyl group having from 1 to 6 carbon atoms, an alkoxy group having from 1 to 6 carbon atoms or a hydroxy group), a —L—N(R12)(R13) group (wherein L, R12 and R13 are as defined above), a —L—OR15 group (wherein R15 is a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms or an alkenyl group having from 1 to 6 carbon atoms), a —L—OC(O)R16 group (wherein R16 is an alkyl group having from 1 to 6 carbon atoms or an alkoxy group having from 1 to 6 carbon atoms), a —L—S(O)$_n$R15 group (wherein R15 is as defined above, and n is an integer of 0 or 2), a —L—SC(O)R12 group (wherein R12 is as defined above), or a salt thereof.

5. A method for controlling weeds, which comprises applying a herbicidally effective amount of a pyrazole derivative of the formula I as defined in claim 1 or its salt to a locus to be protected.

4,885,023

THIADIAZABICYCLONONANE DERIVATIVES AND HERBICIDAL COMPOSITIONS

Mikio Yamaguchi; Yukihiro Watase, both of Shizuoka; Takeshi Kambe, Tokyo, and Susumu Katou, Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,763

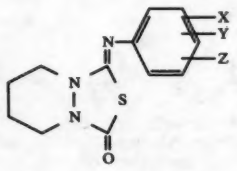
Claims priority, application Japan, Dec. 24, 1986, 61-310423; Sep. 26, 1987, 62-242300

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[4] **C07D** *513/04;* **A01N** *43/82*

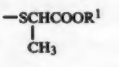
U.S. Cl. 71—90 **21 Claims**

1. A 9-phenylimino-8-thia-1,6-diazabicyclo[4.3.0]nonane-7-one derivative having the formula:



(I)

wherein each of X and Y is hydrogen or halogen, and Z is



wherein R^1 is C_1–C_6 alkyl or C_3–C_6 cycloalkyl, or —$COOR^2$ wherein R^2 is C_1–C_6 alkyl.

4,885,024

BENZOXAZINYL-TRIAZOLE OXIDES AND USE

Masayuki Enomoto, Takarazuka; Eiki Nagano, Tokyo; Toru Haga, Toyonaka; Kouichi Morita, Kasai, and Ryo Sato, Tokyo, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

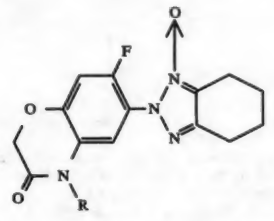
Filed Aug. 22, 1988, Ser. No. 234,625

Claims priority, application Japan, Sep. 1, 1987, 62-218607

Int. Cl.[4] **A01N** *43/76;* **C07D** *413/02*

U.S. Cl. 71—92 **21 Claims**

1. A compound of the formula:



wherein R is a C_1–C_6 alkyl group, a C_3–C_7 alkenyl group, a C_3–C_7 alkynyl group, a C_1–C_4 alkoxy(C_1–C_2)alkyl group, a halo(C_1–C_5)alkyl group, a halo(C_3–C_4)alkenyl group or a halo(C_3–C_4)alkynyl group.

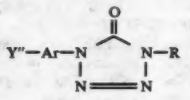
4,885,025

HERBICIDAL TETRAZOLINONES AND USE THEREOF

George Theodoridis, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 23, 1986, Ser. No. 945,925
Int. Cl.[4] C07D *257/04;* A01N *43/713*
U.S. Cl. 71—92 13 Claims

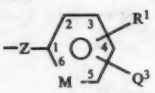
1. Compound of the formula:



where

Y"—Ar— is a substituted phenyl radical in which Y" is at the 5-position relative to the nitrogen atom to which Ar is attached;

Y" is



M is CH,

Z is O, S, NH or alkylamino;

Q^3 is $—[O—CH(R^{4a})CO]_m—OCH(R^4)Q^2$,

Q^2 is $—C(O)R^3$ or —CN;

R^4 and R^{4a} are each independently H, CH_3 or C_2H_5;

R^3 is OH, alkoxy, alkylthio, lower alkenyloxy or alkynyloxy, amino, arylamino, alkylamino, alkenylamino, alkynylamino, alkoxyamino or alkyl-, haloalkyl- or arylsulfonylamino of the formula $—NHSO_2R^5$ or $—N(SO_2R^5)SO_2R^6$, or an $—O—N=R^8$ radical where R^8 is alkylidene;

R^5 and R^6 are each independently alkyl, haloalkyl or aryl;

"m" is zero or one;

R^1 is H, alkyl, halogen, haloalkyl, nitro, NH_2, lower alkoxy or alkylthio or cyano;

Ar is a substituted benzene ring with Ar and R being so chosen that when Y" is methoxy or propargyloxy, instead of having the formula given above, the compound is a herbicide.

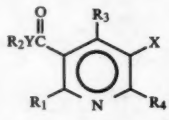
4,885,026

CERTAIN 3-AMINO-5-CARBOXY (OR THIO CARBOXY) PYRIDINE HERBICIDES

Len F. Lee, St. Charles, Mo., and Mark G. Dolson, San Pablo, Calif., assignors to Monsanto Company, St. Louis, Mo.

Filed May 12, 1986, Ser. No. 861,954
Int. Cl.[4] C07D *213/55, 213/56;* A01N *43/40*
U.S. Cl. 71—94 18 Claims

1. A compound having the structural formula



wherein:

Y is selected from O and S;

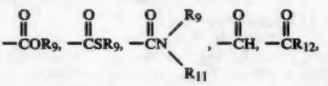
R_1 and R_4 are independently selected from fluorinated methyl, chlorofluorinated methyl, and C_1–C_4 alkyl, provided that not both R_1 and R_4 may be C_1–C_4 alkyl;

R_2 is selected from hydrogen, lower alkyl, haloalkyl, alkenyl, alkynyl, haloalkenyl, and a cation;

R_3 is selected from C_1–C_5 alkyl, cycloalkyl, cycloalkylalkyl, hydroxy, and alkoxy; and

X is

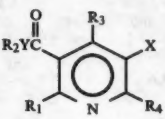
where R_6 is selected from H,



and $—CH_2R_{13}$ in which R_9 is C_1–C_4 alkyl, R_{11} is selected from H and C_1–C_4 alkyl, R_{12} is selected from R_1 and lower haloalkyl, where

R^1 is C_1–C_4 alkyl, R_{13} is hydrogen, alkyl, or haloalkyl.

13. A herbicidal method comprising applying to the plan locus a compound having the structural formula



wherein:

Y is selected from O and S;

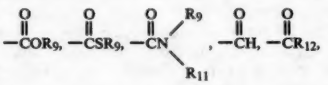
R_1 and R_4 are independently selected from fluorinated methyl, chlorofluorinated methyl, and C_1–C_4 alkyl, provided that not both R_1 and R_4 may be C_1–C_4 alkyl;

R_2 is selected from hydrogen, lower alkyl, and a cation;

R_3 is selected from C_1–C_5 alkyl, cycloalkyl, cycloalkylalkyl, hydroxy, and alkoxy; and

X is

where R_6 is selected from H,



and $—CH_2R_{13}$ in which R_9 is C_1–C_4 alkyl, R_{11} is selected from H, and C_1–C_4 alkyl, R_{12} is selected from R^1 and lower haloalkyl, where R^1 is C_1–C_4 alkyl, R_{13} is hydrogen, alkyl, or haloalkyl.

4,885,027

HERBICIDAL ARYLMETHYLENESULFONAMIDO-ACETAMIDE AND THIOACETAMIDE DERIVATIVES

Patricia B. Pomidor, Fremont, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 720,234, Apr. 5, 1985, abandoned, and Ser. No. 774,685, Sep. 11, 1985, abandoned. This application Nov. 14, 1986, Ser. No. 931,278
Int. Cl.[4] A01N *41/06, 43/20;* C07C *143/78*
U.S. Cl. 71—103 81 Claims

1. A compound having the formula:

(Ix)

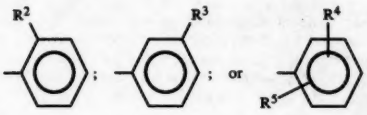
wherein

X is O═ or S═;

R is lower alkyl having 1 through 6 carbon atoms; cycloalkyl having 3 through 6 carbon atoms; (cycloalkyl)alkyl having 3 through 6 carbon atoms in the cycloalkyl moiety and 1 through 3 carbon atoms in the alkyl moiety; lower alkenyl having 2 through 6 carbon atoms; lower alkynyl having 2 through 6 carbon atoms; 3-iodopropargyl; alkanoyl having 2 through 6 carbon atoms; alkoxyalkyl wherein the alkoxy and alkyl moieties independently have 1 through 6 carbon atoms; alkylthioalkyl wherein the alkyl moieties thereof independently have 1 through 6 carbon atoms; epoxyalkylmethylene having 3 through 6 carbon atoms; haloalkylmethyl having 2 through 4 carbon atoms and 1 through 4 halo atoms independently selected from the group of fluoro, chloro and bromo; or cyanomethyl;

R^1 is hydrogen; alkanoyl having 2 through 5 carbon atoms; or hydroxy; with the proviso that when X is S═, then R^1 is hydrogen;

Ar is substituted phenyl selected from the group of tetrafluorophenyl; pentafluorophenyl; trisubstituted phenyls having three substituents independently selected from the group of fluoro, chloro, bromo and trifluoromethyl; and substituted phenyls having the formulas

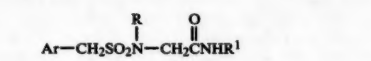


wherein R^2 is methyl, trifluoromethyl or chloro;

R^3 is halo, alkyl having 1 through 4 carbon atoms, alkoxy having 1 through 4 carbon atoms, fluoroalkyl having 1 through 4 fluoro atoms and 1 through 4 carbon atoms or nitro; one of R^4 or R^5 is trifluoromethyl or chloro and the other is halo, nitro, alkyl having 1 through 4 carbon atoms, alkoxy having 1 through 4 carbon atoms, or fluoroalkyl having 1 through 4 fluoro atoms and 1 through 4 carbon atoms;

and hydrates and compatible salts of the compounds of formula (IX).

3. A compound having the formula:

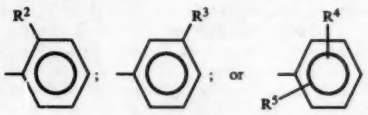


wherein

R is a lower alkyl having 1 through 6 carbon atoms; cycloalkyl having 3 through 6 carbon atoms; (cycloalkyl)alkyl having 3 through 6 carbon atoms in the cycloalkyl moiety and 1 through 3 carbon atoms in the alkyl moiety; lower alkenyl having 2 through 6 carbon atoms; lower alkynyl having 2 through 6 carbon atoms; 3-iodopropargyl; alkanoyl having 2 through 6 carbon atoms; alkoxyalkyl wherein the alkoxy and alkyl moieties independently have 1 through 6 carbon atoms; alkylthioalkyl wherein the alkyl moieties thereof independently have 1 through 6 carbon atoms; epoxyalkylmethylene having 3 through 6 carbon atoms; haloalkylmethyl having 2 through 4 carbon atoms and 1 through 4 halo atoms independently selected from the group of fluoro, chloro and bromo; or cyanomethyl;

R^1 is hydrogen, alkanoyl having 2 through 5 carbon atoms; or hydroxy;

Ar is substituted phenyl selected from the group of tetrafluorophenyl; pentafluorophenyl; trisubstituted phenyls having three substituents independently selected from the group of fluoro, chloro, bromo and trifluoromethyl; and substituted phenyls having the formulas

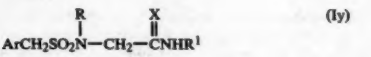


wherein R^2 is methyl, trifluoromethyl or chloro;

R^3 is halo, alkyl having 1 through 4 carbon atoms, alkoxy having 1 through 4 carbon atoms, fluoroalkyl having 1 through 4 fluoro atoms and 1 through 4 carbon atoms or nitro; one of R^4 or R^5 is trifluoromethyl or chloro and the other is halo, nitro, alkyl having 1 through 4 carbon atoms, alkoxy having 1 through 4 carbon atoms, or fluoroalkyl having 1 through 4 fluoro atoms and 1 through 4 carbon atoms;

and hydrates and compatible salts thereof.

58. A compound having the formula:



(Iy)

wherein

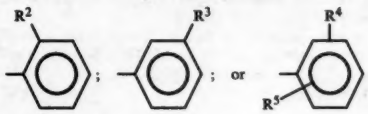
X is O═ or S═;

R is hydrogen,

R' is hydrogen or methyl;

R^1 is hydrogen, alkanoyl having 2 through 5 carbon atoms, or hydroxy; with the proviso that when X is S═, then R^1 is hydrogen;

Ar is substituted phenyl selected from the group of tetrafluorophenyl; pentafluorophenyl; p trisubstituted phenyls having three substituents independently selected from the group of fluoro, chloro, bromo and trifluoromethyl; and substituted phenyls having the formulas



wherein R^2 is methyl, trifluoromethyl or chloro;

R^3 is halo, alkyl having 1 through 4 carbon atoms, alkoxy having 1 through 4 carbon atoms, fluoroalkyl having 1 through 4 fluoro atoms and 1 through 4 carbon atoms or nitro; one of R^4 or R^5 is trifluoromethyl or chloro and the other is halo, nitro, alkyl having 1 through 4 carbon atoms, alkoxy having 1 through 4 carbon atoms, or fluoroalkyl having 1 through 4 fluoro atoms and 1 through 4 carbon atoms; and

hydrates and compatible salts of the compounds of Formula (Iy).

4,885,028

PROCESS FOR PRODUCING PREALLOYED TUNGSTEN ALLOY POWDERS

Nelson E. Kopatz, Sayre, Pa.; Walter A. Johnson, Houghton, Mich.; Jack E. Vanderpool, Laceyville, and Howard H. Shaw, Monroeton, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 3, 1988, Ser. No. 253,173

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—0.5 BB **5 Claims**

1. A process for producing tungsten heavy alloy powders comprising:

(a) forming a relatively uniform blend of a relatively finely

divided tungsten powder and a relatively timely divided second metal powder component wherein said second metal is nickel, iron and mixtures thereof, wherein the weight ratio of nickel to iron is from about 1% to about 100%, wherein the tungsten constitutes from about 70% to about 98% by weight of the blend and the balance is the second metal component,

(b) forming a solid particulate material containing said blend and a volatile binder,

(c) forming agglomerates having a size of from about 10 to about 80 micrometers from the particulate material by heating to a temperature sufficient to remove the volatile binder,

(d) entraining at least a portion of said agglomerates in a carrier gas to form a mixture,

(e) feeding the resulting entrained agglomerates and said carrier gas mixture into a high temperature zone and retaining the agglomerates in the zone for a sufficient time to achieve a temperature in the agglomerates of between the melting point of the second metal component and the boiling point of the lowest melting metal in the second metal component to form partially molten droplets and

(f) cooling said droplets to form a powdered tungsten heavy alloy having a continuous phase of an alloy of tungsten and the second metal component and a discontinuous tungsten phase of individual tungsten grains having essentially the same size as the initial tungsten powder particles and wherein tungsten constitutes from about 70% to about 98% by weight of the alloy and the balance is the second metal component.

4,885,029

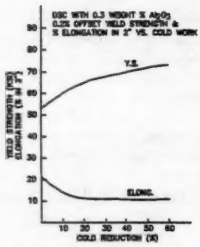
THIN SECTION DISPERSION STRENGTHENED COPPER BODY AND METHOD OF MAKING SAME

Thomas B. Buerkle, Greensburg, Pa., and Jack D. Troxell, North Olmsted, Ohio, assignors to SCM Metal Products, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 23,135, Mar. 9, 1987, abandoned. This application Apr. 1, 1988, Ser. No. 176,793

Int. Cl.[4] C22C *29/12*

U.S. Cl. 75—235 **21 Claims**



1. A thin section of fibrous dispersion strengthened copper body containing a refractory metal oxide in an amount equivalent to from about 0.1% to about 1.1% by weight as discrete micro particles having a particle size of less than about 0.1 micron uniformly dispersed throughout said body, said body being characterized by a sufficiently elevated recrystallization temperature to provide a yield strength from about 65 ksi to about 90 ksi without recrystallization, at a predetermined thickness, said elevated recrystallization temperature resulting from cold size reducing said body in successive stages and heating said body to a temperature of at least about 600° F. at intervals during said size reduction.

4,885,030

TITANIUM DIBORIDE COMPOSITE BODY

David Moskowitz, Southfield, and Charles W. Phillips, Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 124,383, Nov. 20, 1987, Pat. No. 4,880,600. This application Jul. 15, 1989, Ser. No. 220,127

Int. Cl.[4] C22C *29/04*

U.S. Cl. 75—238 **3 Claims**

1. A titanium diboride based material consisting essentially of 5–20% by weight of an iron metal group binder, said binder being selected from the group consisting of cobalt, nickel, and iron, or alloys thereof, and the remainder being essentially titanium diboride except for up to 1.0% oxygen and up to 2% graphite, said material being the heat fused product of said compacted mixture and exhibiting a hardness of at least 90 Rockwell A and a transverse rupture strength of at least 100,000 psi, said heat fused product having a titanium diboride grain size equal to or less than 5 microns.

4,885,031

FINE GRAIN TUNGSTEN HEAVY ALLOYS CONTAINING ADDITIVES

James R. Spencer, Sayre, and James A. Mullendore, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 4, 1988, Ser. No. 140,373

Int. Cl.[4] C22C *27/04*

U.S. Cl. 75—248 **1 Claim**

1. A consolidated tungsten heavy alloy body consisting essentially of from about 88 percent to about 98 percent by weight of tungsten, from about 0.25 percent to about 1.5 percent by weight rhenium, balance nickel and iron in a ratio of nickel to iron of about 7:3 to about 8:2, whereby said body has a grain size of greater than about 3500 grains per mm^2.

4,885,032

ALUMINUM FLAKE PIGMENT

Toshihiro Okai, Katano; Yoshiaki Okumura, Joyo; Mitsuyuki Oda, Kyoto; Takashi Yamamoto, Souraku, and Teruaki Kuwajima, Higashiosaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Aug. 31, 1987, Ser. No. 90,969

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—251 **3 Claims**

1. An aluminum flake pigment for metallic paint of a maximum dimension of not more than 1 mm having excellent brightness retention and resistance to corrosion, which is coated with a film resulting from an aqueous solution containing phosphate ions, soluble ions of vanadium and oxygen such as to render the aluminum flakes resistant to corrosion, said aqueous solution containing 0.001 to 0.1 mole/liter of the phosphate ions, 0.001 to 0.1 mole/liter of the soluble ions of vanadium and having a pH of 5 to 9.

4,885,033

PIGMENT COMPOSITIONS BASED ON ACETOACETARYLIDE DERIVATIVES

John B. Blackburn, Beith, and Alexander Hamilton, Glasgow, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 23, 1988, Ser. No. 248,078

Claims priority, application United Kingdom, Oct. 3, 1987, 8723257; Oct. 14, 1987, 8724085

Int. Cl.[4] C08K *5/00*

U.S. Cl. 106—494 **15 Claims**

1. A pigment composition, suitable for use in modern offset and letter press inks, comprising:

(A)

(a) a pigment derived from (i) acetoacet-2,4-xylidide coupled on to tetrazotised 3,3'-dichlorobenzidine or from (ii) the mixed coupling of two or more of acetoacetanilide,

acetoacet-2-anisidide, acetoacet-2-toluidide, acetoacet-2-chloranilide, acetoacet-2,4-xylidide and acetoacet-2,5-dimethoxy-4-chloranilide on to tetrazotised 3,3'-dichlorobenzidine;

(b) a dyestuff derived from coupling acetoacetanilide, acetoacet-2-toluidide, acetoacet-2-chloranilide or acetoacet-2,4-xylidide on to tetrazotised benzidine-2,2'-disulfonic acid; and optionally

(c) a resin or resinous material

and

(B)

(a) a pigment derived from coupling one or more of acetoacetanilide, acetoacet-2-anisidide, acetoacet-2-toluidide, acetoacet-4-toluidide, acetoacet-2-chloranilide, acetoacet-2,4-xylidide and acetoacet-2,5-dimethoxy-4-chloranilide on to one or both of tetrazotised 3,3'-dichlorobenzidine annd tetrazotised 3,3'-dimethoxybenzidine; and

(b) an aliphatic amine,

the ratio of components (A) and (B) in the pigment composition of the invention ranging from 35:65 to 95:5.

4,885,034

METHOD OF MAKING A COMPOSITE TiO_2 PIGMENT

Wolfgang Kreth, Duisburg, and Wolf-Dieter Griebler, Moers, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 24, 1987, Ser. No. 88,882

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628661

Int. Cl.[4] C04B *14/30;* C07C *1/36*

U.S. Cl. 106—449 **5 Claims**

1. A method of producing a composite uncoated TiO_2 pigment having a controlled surface area in the range of 30 to 250 m^2/g and a controlled particle size in the range of 0.007 to 0.35 microns and containing an inert extender, which comprises the steps of:

(a) forming metatitanic acid suspension containing free and combined sulfuric acid and substantially free from chromophoric substances;

(b) neutralizing said metatitanic acid suspension with at least one compound selected from the group which consists of calcium oxide, calcium hydroxide, calcium carbonate, barium oxide, barium hydroxide, barium carbonate, and mixtures thereof in an amount substantially stoichiometrically equivalent to the total sulfate of said solution, thereby coprecipitating in an intimate mixture with metatitanic acid at least one inert extender selected from the group which consists of calcium sulfate and barium sulfate;

(c) subjecting the coprecipitate formed in step (b) to a hydrothermal treatment by heating said coprecipitate in an autoclave at a temperature of 100° to 500° C. for 30 to 120 minute prior to recovering the coprecipitate and establishing the controlled specific surface area of the coprecipitate of 30 to 250 m^2/g, the hydrothermal treating temperature being inversely proportional to the specific surface area of the coprecipitate;

(d) recovering the coprecipitate formed in steps (b) and (c); and

(e) drying the coprecipitate recovered in step (d) to recover the composite TiO_2 pigment prior to coating said pigment.

4,885,035

METHOD OF CRYSTALLIZATION OF HONEY

Malcolm Slifkin, Pittsburgh, Pa., assignor to Himmelrich and Company, Deerfield Beach, Fla.

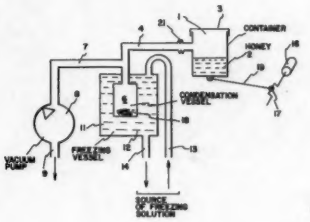
Continuation-in-part of Ser. No. 139,804, Dec. 30, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 302,135

Int. Cl.[4] C13F *1/02*

U.S. Cl. 127—58 **1 Claim**

1. A method of producing crystallized, porous, substantially dry honey from honey which comprises the steps of: mixing honey with distilled water to obtain a honey-water mixtures;

placing said honey-water mixture in an air-tight container which above the level of said mixture is in fluid communication with a condensation vessel; homogenizing said honey-water mixture with a vibrating means in said container to obtain a homogenized mixture: cooling said condensation vessel to a temperature substantially in the range from −80° C. to −15° C.;



passing said homogenized mixture to said condensation vessel; and, without deproteinizing, filtering or pigmenting said homogenized mixture in said container, applying vacuum to said cooled condensation vessel to remove water from said homogenized mixture in said container into said condensation vessel and to convert said homogenized mixture in said container to crystallized, porous honey containing not more than substantially 4% water.

4,885,036

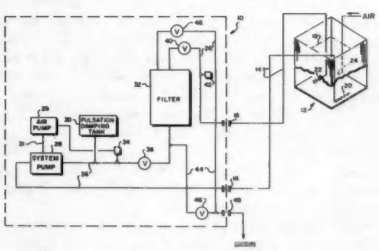
ON-LINE FILTRATION OF POTASSIUM PERMANGANATE

Warren S. Crippen, Simpsonville, S.C., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 880,711, Jul. 1, 1986, abandoned. This application Apr. 19, 1988, Ser. No. 185,245

Int. Cl.[4] B08B *7/04*

U.S. Cl. 134—13 **23 Claims**



1. A method of removing manganese dioxide precipitate that forms in a desmearing tank during a desmearing process that employs a desmearing solution including potassium permanganate so as to cause a solutionprecipitate mixture, including the manganese dioxide precipitate, to form in the desmearing tank during the desmearing process, comprising the steps of:

(a) continually pumping the solution-precipitate mixture from the desmearing tank at least concurrently with the desmearing process;

(b) filtering the solution-precipitate mixture pumped from the desmearing tank to remove the precipitate including the manganese dioxide precipitate therefrom; and

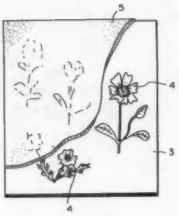
(c) returning the filtered solution to the desmearing tank concurrently with said solution-precipitate pumping.

4,885,037

METHOD FOR PRODUCING ARTICLE INCLUDING PRESS-DRIED PLANT

Takemi Ohkubo, Fukuoka, Japan, assignor to Esu-Oh Giken Co., Ltd., Fukuoka, Japan

Filed Jun. 1, 1988, Ser. No. 201,090
Int. Cl.[4] A01N 3/00
U.S. Cl. 156—57 23 Claims



1. A method for producing an article including a press dried plant comprising the steps of:
interposing a picked plant between two flexible sheets impregnated with a desiccating agent or between one of said flexible sheets and a cushioning sheet;
drying the plant under pressure in a drying atmosphere;
removing the dried plant from between said sheets;
hermetically storing the dried plant in a bag of a gas barrier material, the bag containing a desiccating agent and an oxygen absorbing agent;
removing the plant from the bag shortly before producing the article carrying the press-dried plant;
placing the plant on a surface of a substrate, and;
forming a transparent or translucent overlayer on the plant so that air does not remain between the overlayer and the surface of the substrate.

4,885,038

METHOD OF MAKING MULTILAYERED CERAMIC STRUCTURES HAVING AN INTERNAL DISTRIBUTION OF COPPER-BASED CONDUCTORS

Herbert R. Anderson, Jr., Patterson, N.Y.; Renuka S. Divakaruni, Ridgefield, Conn.; Joseph M. Dynys, Poughkeepsie, N.Y.; Steven M. Kandetzke, Fishkill, N.Y.; Daniel P. Kirby, Poughkeepsie, N.Y.; Raj N. Master, Wappingers Falls, N.Y., and Jon A. Casey, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1986, Ser. No. 858,488
Int. Cl.[4] B32B 31/24; C04B 33/32
U.S. Cl. 156—89 10 Claims

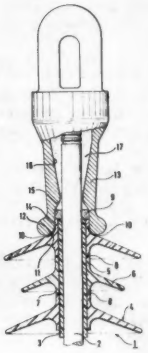
1. A method of forming a multilayer ceramic packaging structure having an internal pattern of copper-based metal conductors therein comprising the steps of:
preparing a plurality of greensheets of at least a ceramic or glass-ceramic material and an organic binder material;
coating particles of said copper-based metal with an organometallic polymer material which decomposes to form a decomposition product which provides a conformal layer about said metal particles;
preparing a conductor paste comprising at least said coated metal particles and a binder;
applying a pattern of said conductor paste to said plurality of greensheets;
stacking and laminating said plurality of metallized greensheets;
heating said metallized greensheets in an oxidizing ambient to a first temperature sufficient to effect removal of said organic binder material from said greensheets but not sufficient to effect removal of said conformal layer;
substituting an inert ambient for said oxidizing ambient; and
firing said metallized greensheets in said inert ambient to a second temperature sufficient to coalesce said ceramic or glass-ceramic materials and to sinter said conductors but not sufficient to melt said conductors.

4,885,039

METHOD OF CONNECTING A METAL END FITTING TO AN INSULATOR COMPONENT HAVING AN ELASTOMER END FIN AND AN ORGANIC ELECTRICAL INSULATOR OBTAINED BY THE METHOD

Guy Thevenet, Le Bourg, France, assignor to Ceraver, S.A., Paris, France

Continuation of Ser. No. 588,051, Mar. 9, 1984, abandoned. This application Dec. 22, 1987, Ser. No. 136,523
Claims priority, application France, Mar. 18, 1983, 83 04450
Int. Cl.[4] H01B 17/20, 17/02
U.S. Cl. 156—294 4 Claims



1. A method for connecting a metal end fitting having a socket with an open end to an exposed end of an insulating rod surrounded by a plurality of axially disposed fins of vulcanized elasomer, the plurality of fins terminating in an end fin disposed next to the exposed end of the insulating rod, the method comprising
coating at least one layer of a rubber-to-metal gluing agent on an annular portion of the socket of the metal end fitting adjacent to the open end of the socket;
disposing a washer of raw elastomer around the exposed end of the insulation rod in contact with the end fin;
inserting the exposed end of the insulating rod into the open end of the socket of the end fitting so that the washer is contacted by the coated annular portion of the end fitting and is compressed between the end fitting and the end fin;
fixing the end fitting to the end of the insulation rod so as to maintain the washer compressed between the end fitting and the end fin; and then vulcanizing the washer.

4,885,040

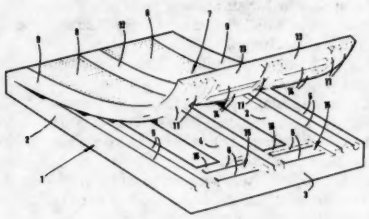
PROCEDURE FOR MANUFACTURING A SCREEN-MAT AS AN IN-LAY FOR SYSTEMATIC SCREEN FIELDS

Kurt Wolff, Dinslaken, Fed. Rep. of Germany, assignor to Steinhaus GmbH, Mulheim, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 196,528
Claims priority, application Fed. Rep. of Germany, May 16, 1987, 3716472
Int. Cl.[4] B29C 47/00
U.S. Cl. 156—244.18 8 Claims

1. A method of manufacturing a screen mat that can be removably attached to a supporting frame element, comprising the steps of extruding a thermoplastic synthetic material to

form an elongated extrusion having upper and lower flat surfaces and having at least one integral longitudinal rib extending in the direction of elongation of said extrusion and protruding outwardly from said lower surface adjacent to each of the longitudinal edges of said extrusion, cutting said extrusion in directions transverse to said longitudinal edges to provide a section of said extrusion of desired length, said section having



said longitudinal edges and lower flat surface with said integral longitudinal ribs thereon and also having transverse edges formed by said cutting step, and attaching strips of material to said lower flat surface of said extrusion section at positions between said longitudinal ribs, each of said attached strips having at least one further rib extending outwardly of said strip, and each of said strips being so oriented that said further rib extends in a direction transverse to said longitudinal ribs.

4,885,041

METHOD FOR THE MANUFACTURE OF FORMABLE STEEL STRIP

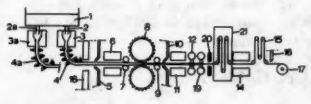
Huibert W. den Hartog, Noordwijkerhout, and Erik B. van Perlstein, Beverwijk, both of Netherlands, assignors to Hoogovens, Groep B.V., Ijmuiden, Netherlands

Filed Aug. 23, 1988, Ser. No. 235,152

Claims priority, application Netherlands, Sep. 1, 1987, 8702050

Int. Cl.[4] C21D *8/02*

U.S. Cl. 148—2 **22 Claims**



1. Method for the manufacture of formable steel strip having a thickness between 0.5 and 1.5 mm characterised by the following process steps which are performed sequentially in a continuous process:

(a) in a continuous casting machine forming liquid steel into a hot slab having a thickness of less than 100 mm,

(b) hot rolling the hot slab from step (a), in the austenitic region and below 1100° C., to form strip having a thickness of between 2 and 5 mm,

(c) cooling the strip from step (b) to a temperature between 300° C. and the temperature T_f at which 75% of the steel is converted to ferrite,

(d) rolling the cooled strip from step (c) at said temperature between 300° C. and T_f with a thickness reduction of at least 25% at a rolling speed not more than 1000 m/min.,

(e) coiling the rolled strip from step (d).

4,885,042

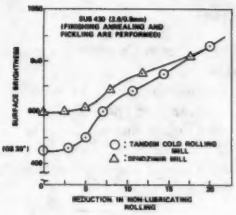
METHOD AND APPARATUS FOR PRELIMINARY TREATMENT OF STAINLESS STEEL FOR COLD ROLLING

Kazuhito Kenmochi; Akihiko Fukuhara; Tomio Komatu; Masanori Kitahama; Hideo Abe; Akira Kishida; Fumiya Yanagishima, and Makoto Kobayashi, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Japan

Filed May 18, 1988, Ser. No. 195,723

Int. Cl.[4] C21D *8/00*

U.S. Cl. 148—12 E **4 Claims**


SUS 430 (2.0/0.8mm)
(FINISHING ANNEALING AND PICKLING ARE PERFORMED)
SURFACE BRIGHTNESS
○ : TANDEM COLD ROLLING MILL
△ : SENDZIMIR MILL
REDUCTION IN IRON-LUBRICATING ROLLING

1. A method for preliminary treatment of a stainless steel strip in preparation for a cold rolling process for producing a stainless steel strip having high surface brightness, comprising the steps of:

performing annealing and pickling of a hot rolled stainless steel strip; and

subsequently performing rolling of said strip in a mill without introducing lubricant into said rolling mill.

4,885,043

METHOD FOR SELECTIVE DECARBURIZATION OF IRON BASED MATERIAL

Mohammed Y. Al-Jaroudi, Stockholm, Sweden, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 1, 1988, Ser. No. 162,719

Claims priority, application Sweden, Mar. 23, 1987, 8701197

Int. Cl.[4] C21D *3/04*

U.S. Cl. 148—113 **10 Claims**

1. The method for selective decarburization of an iron based substrate by extraction of carbon present in the iron based substrate comprising the steps of

making the surface of said iron based substrate with a plated metal layer leaving a predetermined pattern of the substrate surface uncovered;

depositing a titanium nitride film onto the surface of the substrate by vacuum deposition at a temperature not exceeding 600 degrees centigrade to remove from the unmasked substrate surface portions; and

thereafter removing the selectively applied metal masking layer.

4,885,044

METHOD OF CONTROLLING HARDNESS OF PIPE WELD-JOINTS BY RADIALLY INSERTING INSULATING RINGS PRIOR TO TEMPERING HEAT-TREATMENT

Donald D. Savard, Edmonton, Canada, assignor to Interprovincial Pipe Line Company, Edmonton, Canada

Continuation-in-part of Ser. No. 98,864, Sep. 21, 1987, abandoned, which is a continuation of Ser. No. 913,681, Nov. 13, 1986, abandoned, which is a division of Ser. No. 837,779, Mar. 10, 1986, Pat. No. 4,634,040. This application Jun. 15, 1988, Ser. No. 207,031

Int. Cl.[4] C21D *9/08, 9/50*

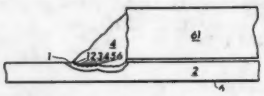
U.S. Cl. 148—127 **3 Claims**

1. A method for reducing the hardness of a heat-affected

zone of the pipe wall in a pipeline filled with liquid, said zone being contiguous to the toe of a circumferential fillet weld formed on the pipe, comprising:

inserting a radially expandable and contractable insulating ring within the pipeline;

positioning the ring beneath the fillet weld and radially



expanding the ring to abut the inner surface of the pipe wall;

heat treating the heat-affected zone with the ring in contiguous relation to the pipe wall;

cooling the zone while maintaining the ring in insulating contact with the inside surface of the pipe wall; and

contracting the ring and removing it from the pipeline.

4,885,045

ALUMINIUM ALLOYS SUITABLE FOR SACRIFICIAL ANODES

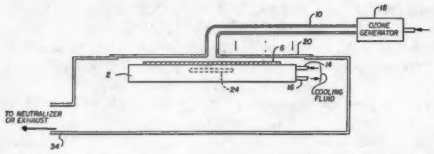
Robin F. May, Greensborough, Australia, assignor to Comalco Aluminum Limited, Melbourne, Australia

Filed Jun. 14, 1988, Ser. No. 206,353

Claims priority, application Australia, Jun. 16, 1987, PI2511

Int. Cl.[4] C22C *21/00*

U.S. Cl. 148—440 **11 Claims**



1. An aluminum alloy consisting essentially of:

	% wt.
In	0.005–0.05
Zn	0.05–8.0
Mg	0.02–2.0
Mn	0.01–0.3
Ga	0.003–0.05
Fe	0.03–0.3
Si	0.03–0.4
Cu	0.02 max.
Grain refiner e.g. Ti—B	0.05 max.
Other elements	0.01 max.
Al	remainder

in which the Mn:Fe ratio is in the range of 0.9:1 to 1.2:1, said alloy haing a grain size in the range of 100 to 600 microns.

4,885,046

Patent Not Issued For This Number

4,885,047

APPARATUS FOR PHOTORESIST STRIPPING

Michael G. Ury, Bethesda; John C. Matthews, Gaithersburg, and Stuart N. Rounds, Germantown, all of Md., assignors to Fusion Systems Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 895,102, Aug. 11, 1986. This application Jan. 11, 1988, Ser. No. 141,856

Int. Cl.[4] B44C *1/22*; B29C *37/00*; C03C *15/00, 25/06*

U.S. Cl. 156—345 **9 Claims**

1. An apparatus for stripping a layer of photoresist from a substrate made of a different material on which said photoresist layer is disposed, comprising,

means for holding said substrate on which said photoresist layer is disposed,

means for disposing a plane surface adjacent said photoresist layer but separated therefrom so as to create a narrow gap of four millimeters or less between said plane surface and said photoresist layer,

means for feeding oxidizing fluid to said narrow gap to cause a thin layer of said oxidizing fluid of four millimeters or less to flow over said photoresist layer,

means for maintaining said means for holding said substrate and said plane surface in stationary relationship to each other while said stripping occurs, and

means for heating said substrate to a temperature over 200° C.

4,885,048

LAMINATOR

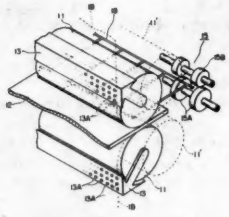
Sigeo Sumi, Saitama; Fumio Hamamura, Kanagawa; Ichio Fukuda; Mitsuhiro Seki, both of Tokyo, and Noriyasu Sawada, Saitama, all of Japan, assignors to Somar Corporation, Tokyo, Japan

Division of Ser. No. 46,603, May 7, 1987, Pat. No. 4,844,772. This application Dec. 2, 1987, Ser. No. 127,729

Claims priority, application Japan, May 7, 1986, 61-104391; May 7, 1986, 61-104392; May 7, 1986, 61-104393; May 7, 1986, 61-104394; Oct. 1, 1986, 61-234167

Int. Cl.[4] B32B *31/10*

U.S. Cl. 156—552 **4 Claims**



1. A laminator for laminating a thin film over a substrate, comprising:

a delivery roller means for delivering a substrate in a predetermined delivery path;

a bonding roller means for bonding the thin film over said substrate; and

a substrate guide means for guiding the substrate from said bonding roller means to said delivery roller means, said substrate guide means being located between said bonding roller means and delivery roller means, wherein said substrate guide means includes a comb-shaped member having a plurality of first rod members extending in a substrate delivery direction and a plurality of second rod members extending in a transversal direction of said substrate.

4,885,049

METHOD OF MANUFACTURE OF AN EXTERNAL CATHETER FOR MALE URINARY INCONTINENCE

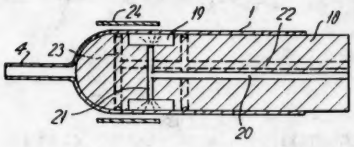
Niels O. Johannesson, Espergerde, Denmark, assignor to Coloplast A/S, Denmark

Filed Oct. 26, 1987, Ser. No. 113,258

Claims priority, application Denmark, Jul. 23, 1984, 3598/84

Int. Cl.[4] A61F *5/44*

U.S. Cl. 156—289 **8 Claims**



1. A method for manufacturing an adhesive connecting external male catheter for urinary incontinence, which method comprises:

(1) providing a substantially cylindrical mandrel having an adhesive-rejecting outer surface on at least a portion thereof;

(2) applying an adhesive to said mandrel;

(3) placing a prefabricated body portion of said catheter having an inner and outer surface around said mandrel such that said adhesive on said mandrel is bonded to said inner surface of said body portion;

(4) applying, to at least a portion of said outer surface of said body portion a cover layer with an outwardly facing adhesive-rejecting surface;

(5) rolling said body portion outwardly on itself wherein said body portion is removed from said mandrel and said adhesive remains on said body portion.

4,885,050

QUAD PROCESSOR

Joseph A. Maher, South Hamilton, Mass.; E. John Vowles, Goffstown; Joseph D. Napoli, Winham, both of N.H.; Arthur W. Zafiropoulo, Manchester, and Mark W. Miller, Burlington, both of Mass., assignors to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 923,125, Oct. 24, 1986, Pat. No. 4,715,921, and a continuation-in-part of Ser. No. 853,775, Apr. 18, 1986. This application Oct. 30, 1987, Ser. No. 115,774

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.[4] H01L *21/306*; B44C *1/22*

U.S. Cl. 156—345 **25 Claims**

1. A mulitple-processing and contamination-free wafer handling and processing system, comprising:

plural, wafer receiving and surface processing vessels each having an ingress and egress defining port that are arrayed about a predetermined spacial locus in such a way that the several ports thereof are accessible from a single location spaced from the several ports;

a wafer queuing station spaced with the plural vessels along the same predetermined spacial locus defining a wafer access port accessible from said single location;

plural valve means individually coupled to corresponding ones of said plural, vessel ingress and egress ports and to said wafer queuing station wafer access port;

transfer means disposed at said single location and cooperative with corresponding ones of said plural valve means for moving wafers from and to said wafer access port of said queuing station from and to selected ones of said wafer receiving and surface processing vessels through the associated one of said ingress and egress ports thereof; and

processor means for controlling said vessels, said transfer means and said valve means to provide selectable single or multistep processing of wafers in said queuing station in one or more of said vessels.

4,885,051

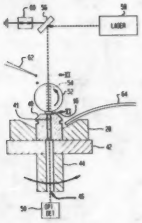
OPTICALLY CONTROLLED DIMPLER FOR PREPARATION OF ULTRATHIN SAMPLES

Dah-min D. Hwang, Holmdel, and Lawrence R. Nazar, Fair Haven, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Mar. 16, 1989, Ser. No. 324,318

Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—345 **10 Claims**



1. A dimpling apparatus for forming a dimple in a sample, comprising:

a stage rotating about a first axis having a first light passage extending along said first axis and for holding a sample adjacent said first light passage;

a wheel contactable with said held sample and rotating about a second axis perpendicular to said first axis and having a second light passage extending at least partially along a radial direction of said wheel and connecting to a circumference of said wheel, an interruptible light path being formed at least partially by said first light passage and said second light passage and being interrupted by a rotation of said wheel;

a light source arranged at a first end of said light path; and

a light detector arranged at a second end of said light path.

4,885,052

ZONE-MELTING RECRYSTALLIZATION PROCESS

John C. C. Fan, Chestnut Hill; Paul M. Zavracky, Norwood, both of Mass.; Jagdish Narayan, Raleigh, N.C.; Lisa P. Allen, Norton, and Duy-Phach Vu, Taunton, both of Mass., assignors to Kopin Corporation, Taunton, Mass.

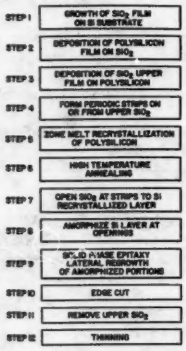
Filed Nov. 13, 1987, Ser. No. 120,016

Int. Cl.[4] C30B *13/00*

U.S. Cl. 156—620.7 **4 Claims**

1. A method of zone melting and recystallization of polysilicon film formed on an insulator over a silicon substrate comprising the steps of:

a. forming a protective capping layer over the polysilicon film with a capping material;
b. forming periodic strips in, or on, said capping layer of material having a melting point above that of silicon and capable of being etched;
c. zone melting and recrystallizing said polysilicon film to transform said polysilicon film to single crystal, or nearly single crystalline silicon structure with crystal defects primarily located beneath the strips;



d. forming openings at said strips to expose the underlying transformed silicon structure;
e. amorphizing the exposed underlying silicon structure leaving single crystal or nearly single crystalline material laterally adjacent the amorphized silicon structure;
f. laterally regrowing said amorphized structure seeded by the single crystal, or nearly single material laterally adjacent thereto.

4,885,053

PROCESS FOR METAL-PLATING AN ELECTRICALLY POORLY CONDUCTING SUBSTRATE MADE OF AN INORGANIC MATERIAL

August F. Bogenschütz, Oberdischingen; Josef L. Jostan, and Robert Ostwald, both of Ulm, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 885,251
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523960
Int. Cl.[4] C03C *15/00*
U.S. Cl. 156—635 **4 Claims**

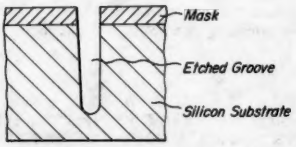
1. A process for etching at least a portion of a surface of a ceramic substrate preparatory to metal-plating thereof, the process comprising:
(a) applying to at least a portion of a surface of a ceramic substrate a substantially uniform coating comprised of a least one chemical precursor of an alkaline etching substance, which at least one chemical precursor is one of an organic alkali compound or an organic alkaline earth compound; and
(b) treating the at least one chemical precursor to chemically transform it into the alkaline etching substance; and
(c) etching said at least a portion of said surface with the alkaline etching substance.

4,885,054

ETCHING METHOD

Masami Shibagaki, Tokyo, Japan, assignor to Anelva Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 23,746, Mar. 9, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 265,351
Claims priority, application Japan, Mar. 25, 1986, 61-66650
Int. Cl.[4] C03C *15/00*
U.S. Cl. 156—643 **14 Claims**



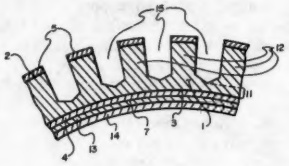
1. A method of etching a silicon substrate in a vessel comprising providing in a vessel, a silicon substrate introducing into said vessel an etching gas wherein said etching gas consists essentially of a gaseous chloride of silicon and a nitrogen-containing gas with or without chlorine as reactive agents, converting said etching gas into a plasma and etching said silicon substrate.

4,885,055

LAYERED DEVICES HAVING SURFACE CURVATURE AND METHOD OF CONSTRUCTING SAME

Richard C. Woodbury; Raymond T. Perkins, and James M. Thorne, all of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Filed Aug. 21, 1987, Ser. No. 87,778
Int. Cl.[4] B05D *5/06*; G02B *5/10*; B44C *1/22*
U.S. Cl. 156—647 **29 Claims**



1. A method of treating a substrate having first and second sides with corresponding oppositely facing first and second surfaces, to produce curvature in the first surface, said method including the steps of:
(a) removing material, according to a preselected pattern, from the second side of the substrate; and
(b) applying a stress-producing film of material to at least one surface of the substrate to thereby cause the substrate to bend to produce the desired curvature in the first surface.

27. A method of producing curvature on a working surface of a substrate having said working surface and another oppositely facing surface, said method including the steps of:
(a) coating at least the working surface of the substrate with a stress-producing film of material; and
(b) removing substrate material in a predetermined pattern from a side of the substrate opposite the working surface to allow the film to bend the substrate and cause the desired curvature of the working surface.

4,885,056

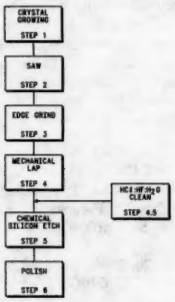
METHOD OF REDUCING DEFECTS ON SEMICONDUCTOR WAFERS

James B. Hall, Chandler, and Sumner Sheff, Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 239,889, Sep. 2, 1988, abandoned. This application Jul. 12, 1989, Ser. No. 378,510

Int. Cl.[4] H01L *21/306*

U.S. Cl. 156—662 11 Claims



1. A method of cleaning a silicon semiconductor wafer comprising: subjecting the wafer to a solution comprising hydrochloric acid and hydrofluoric acid to simultaneously remove impurities and a native oxide from the wafer.

4,885,057

METHOD FOR TREATING SYNTHETIC PULP PARTICLES, AND PULP PARTICLES COMPOSED OF SYNTHETIC POLYMER

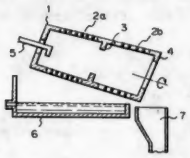
Michio Yamamoto; Tsutomu Kiriyama; Noriaki Sasaki; Yoshitaka Sakamoto, and Kenji Ishimaru, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 28, 1987, Ser. No. 7,964

Claims priority, application Japan, Jan. 30, 1986, 61-16704; Feb. 26, 1986, 61-38978

Int. Cl.[4] D21D *5/00*

U.S. Cl. 162—9 4 Claims



1. A method for treating synthetic pulp particles, which comprises:

(1) treating a slurry of synthetic pulp particles having a Schopper-Riegler freeness of more than 30° SR by a concentrator provided with a rotary filter bed to lower the freeness to not more than 30° SR, said concentrator comprising as the main member a rotary cylinder having on the peripheral surface thereof a filtering surface formed of a wire and/or a perforated plate and having at least one wire in the interior thereof, and said cylinder is arranged so that the filter bed is inclined from the slurry inlet side toward the slurry outlet side and the filter bed is not immersed in the filtrate, whereby the slurry of the synthetic pulp particles are gradually concentrated while the slurry is moved in the rotary cylinder;

(2) pressing the synthetic pulp particle slurry; water-washing the resulting pressed cake of synthetic pulp particles in the state where the freeness is not more than 30° SR; and dispersing the synthetic pulp particles in water to restore the freeness to more than 30° SR.

4,885,058

INORGANIC PAPER AND METHOD FOR ITS MANUFACTURE

Kiyoshi Hani, Sagamihara; Takako Takei, Tokyo; Minekazu Kodama, Takatsuki, and Takahiko Watanabe, Machida, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1984, Ser. No. 646,094

Claims priority, application Japan, Oct. 4, 1983, 58-185337

Int. Cl.[4] D21H *5/18*; 162 *145, 152, 146*

U.S. Cl. 162—145 20 Claims

1. Inorganic based paper, which is made through paper-making process from a mixture consisting essentially of:

(a) as the principal component inorganic fibers composed of an inorganic material and having a fiber diameter of 100 microns or smaller and a fiber length which is ten or more times the fiber diameter; and as the minor component

(b) organic fiber material in a microfibrillar form as a binding agent.

4,885,059

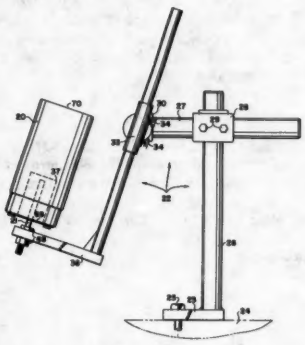
EDGE CURLING DEVICE FOR FOURDRINIER FABRIC

Edmund N. Marx, Jr., 102 E. Weed St., St. Marys, Ga. 31558

Filed Jul. 25, 1988, Ser. No. 223,617

Int. Cl.[4] D21F *1/24*

U.S. Cl. 162—274 19 Claims



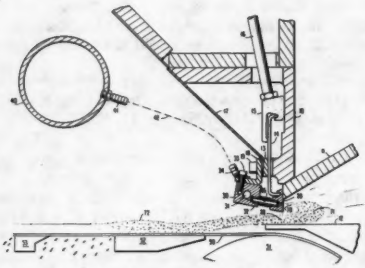
1. In a Fourdrinier papermaking machining having a travelling forming fabric with two lateral edges on a fixed machine frame, a plurality of spaced edge curling devices positioned along and in contact with the respective lateral edges of said forming fabric and structured to curl said lateral edges upwards; each said curling device comprising a generally cylindrical spindle symmetrical about its longitudinal axis mounted on a coaxial shaft with said spindle being freely rotatable about said axis, a mounting bracket for rigidly connecting said shaft to said frame, and an articulated adjustment means for positioning said spindle at any angle of contact and position with respect to said lateral edge, said articulate adjustment means including a plurality of shaft members joined to each other through a shaft connector means structured and arranged to permit axial rotational movement and sliding linear movement of each shaft member with respect to said shaft connector means.

4,885,060

PAPERMACHINE HEADBOX PROFILING BAR WITH FLUID DISCHARGE ORIFICES ALONG ITS LENGTH

Robert L. Beran, and John DeLigt, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 151,323, Feb. 1, 1988, abandoned. This application Aug. 3, 1988, Ser. No. 228,842
Int. Cl.[4] D21F *1/02*
U.S. Cl. 162—344 14 Claims



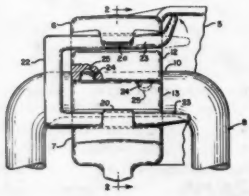
1. A papermachine headbox having an elongated slice opening bounded along the discharge end thereof by slice control means secured to said headbox in a vertical plane as an independent element by removable fastening means, said slice control means including an independently adjustable, elongated profile bar having a multiplicity of fluid discharge orifices through said profile bar and distributed along the cross machine length thereof, said orifices being connected by respective flexible fluid conduits to structurally independent fluid manifold means, said manifold means being connected to fluid supply means for discharge of fluid supplied thereto in a substantially horizontal direction of 50 to 90 degrees of said slice control means vertical plane, and wherein each said flexible fluid conduit comprises a push-fit connection between a section of flexible tubing and a tubing socket in said profile bar respective to each orifice.

4,885,061

BRAKE HANGER SUSPENSION

Finn Jensen, Dolton, and Rudolph E. Nadherny, Naperville, both of Ill., assignors to Gerot-Pharmazeutika Gesellschaft m.b.H., Vienna, Austria

Filed Apr. 9, 1984, Ser. No. 597,936
Int. Cl.[4] F16D *65/14*
U.S. Cl. 188—206 R 3 Claims



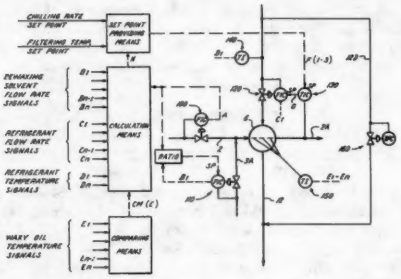
1. In a brake hanger suspension for suspending and securing a brake hanger in the form of a loop between a pair of vertically spaced generally horizontally extending ears on a truck side frame of a railroad car wherein the upper portion of the brake hanger extends through a horizontal opening formed between a pair of retainer blocks locked matingly together between said ears, the improvement which comprises first formations integrally formed on the inner opposing faces of said ears, second formations integrally formed on the outer faces of said retainer blocks which mate with said first formations, third formations integrally formed on the insides of the lips of said ears so as to project toward each other with the rear sides of said third formations being spaced from the front ends of said first and second formations, and locking means providing a pair of legs which extend through the spaces between said rear sides of said third formations and the front ends of said first and second formations, each of said first formations being in the form of a U-shaped lobe, each of said second formations being provided by channels on the outer faces of said retainer blocks, each U-shaped lobe fitting in the channel in the adjacent retainer block, and each of said third formations being in the form of aligned protruberances on the insides of said lips, and said channels of said second formations allowing said retainer blocks to pass by said protruberances when being inserted into place between said ears.

4,885,062

LUBE OIL SOLVENT DEWAXING CONTROL SYSTEM

Charles W. Harrison, Houston, Tex.; Michael J. Gerondale, Glendale, Ariz.; Anthony J. Patrone, Port Arthur, and James O. Y. Ong, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,123
Int. Cl.[4] C10G *73/34*
U.S. Cl. 196—14.5 18 Claims



1. A control system in combination with a lubricating oil dewaxing apparatus in which dewaxing solvent is mixed with a waxy oil at a selected ratio of solvent to waxy oil and the solvent-waxy oil mixture is chilled to a selected filtering temperature by indirect heat exchange with refrigerant in a heat exchange apparatus comprising a series of at least three chillers, to become a slurry mix which is provided to a filter, said control system comprising:

A. a first flow control means for controlling the flow rate of the waxy oil to the series of chillers and providing a signal corresponding thereto,

B. second flow control means for controlling and providing a signal corresponding to the flow rate of dewaxing solvent to each chiller in the series of chillers,

C. third flow control means for controlling the flow rate of refrigerant to each chiller in the series of chillers,

D. a plurality of temperature sensing means arranged in sequence for sensing the temperature of the waxy oil flowing through the series of chillers and providing a plurality of signals corresponding thereto, the plurality of temperature sensing means sufficient in number to sense three sequential zones comprising: a chilling rate zone, an isothermal heat transfer zone and a filtering temperature zone,

E. a refrigerant temperature sensing means,

F. comparing means for receiving said plurality of waxy oil temperature signals and determining by comparison a sequence of adjacent temperature sensing means of said plurality of temperature sensing means at which a rela-

tively isothermal heat transfer takes place thereby defining said isothermal heat transfer zone,

G. set point providing means for providing to the third flow control means set point signals comprising:

1. a first set point signal provided to the third flow control means located upstream of said isothermal heat transfer zone to provide flow control of refrigerant to said chilling rate zone in accordance with a selected chilling rate of 1° to 6° F./min.,
2. a second set point signal provided to the third flow control means located downstream of said isothermal heat transfer zone, to provide flow control of refrigerant to said filtering temperature zone in accordance with said selected filtering temperature,
3. a third set point signal provided to the third flow control means located at said isothermal heat transfer zone, in accordance with crystallizing a major portion of the wax in said waxy oil.

4,885,063

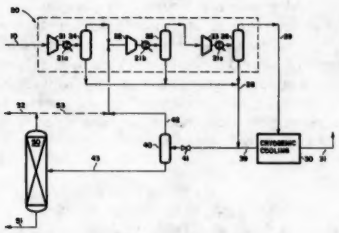
METHOD AND APPARATUS FOR OLEFIN RECOVERY

Robert S. Andre, Coopersburg, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 150,816, Feb. 1, 1988, abandoned. This application Oct. 19, 1988, Ser. No. 260,345

Int. Cl.[4] C07C *7/04*; F25J *3/02*

U.S. Cl. 203—73 **17 Claims**



1. A method for recovering one or more olefinic hydrocarbons, each having three, four, or five carbon atoms, from a feed stream comprising said olefinic hydrocarbons and lower-boiling components, said method comprising:

(a) compressing and cooling the feed stream to 100–500 psig and 50°–150° F. in a compression train comprising one or more compressor stages, each stage consisting of a compressor, an aftercooler, and a vapor-liquid separator, thus producing a first compressed vapor stream and a first condensate stream;

(b) cooling and partially condensing said first compressed vapor stream to yield a second vapor stream and a second condensate stream, said second condensate stream comprising from 1 to 30% of components having lower boiling points than said olefinic hydrocarbons;

(c) combining said first and said second condensate streams and flash evaporating the combined stream at a pressure of 0 to 200 psig thus producing a third vapor stream and a liquid stream, wherein said third vapor stream comprises at least some of said lower-boiling components in said combined stream; and

(d) separating said liquid stream by distillation to yield a vapor product containing substantially all of the lower-boiling components in said liquid stream and a liquid product rich in the olefinic hydrocarbons in said feed stream.

4,885,064

ADDITIVE COMPOSITION, PLATING BATH AND METHOD FOR ELECTROPLATING TIN AND/OR LEAD

George S. Bokisa, Fairview Park, and Billie J. Page, Cleveland Hts., both of Ohio, assignors to McGean-Rohco, Inc., Cleveland, Ohio

Filed May 22, 1989, Ser. No. 355,409

Int. Cl.[4] C25D *3/32, 3/36, 3/56, 3/60*

U.S. Cl. 204—44.4 **29 Claims**

1. An aqueous plating bath for electrodeposition of tin, lead, or tin-lead alloys comprising

(A) at least one bath-soluble metal salt selected from the group consisting of a stannous salt, a lead salt, or a mixture of stannous and lead salts; and

(B) at least one alpha-acetylenic alcohol or glycol of the formula

$$R_1R_2C(OH)C{\equiv}CR_3 \qquad (I)$$

wherein

R_1 and R_2 are each independently H, an alkyl group, a cycloalkyl group or R_1 and R_2 together with the carbon atom form a cyclic group, provided that at least one of R_1 and R_2 is an alkyl group containing at least three carbon atoms, and

R_3 is H, an alkyl group or $-C(OH)R_1R_2$.

26. The plating bath of claim 25 wherein the antioxidant is catechol.

4,885,065

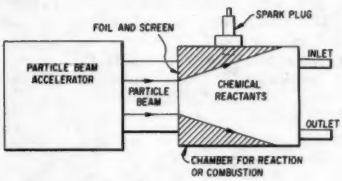
ELECTRON BEAM, ION BEAM, OR NEUTRAL PARTICLE BEAM INDUCED MODIFICATION OF OR ENHANCEMENT OF COMBUSTION REACTIONS

Ronald M. Gilgenbach, Ann Arbor, Mich., assignor to The University of Michigan-Ann Arbor, Ann Arbor, Mich.

Filed May 29, 1987, Ser. No. 55,611

Int. Cl.[4] B01J *19/08*

U.S. Cl. 204—157.6 **21 Claims**



1. A process for modifying or enhancing a combustion reaction, comprising subjecting an organic material undergoing a combustion reaction, either immediately prior to or during the combustion process, to pulsed irradiation with an electron beam, an ion beam, a neutral particle beam, or a combination of these, wherein each beam has an energy of from 10^{-2} ev to 10^{7} eV and a current of from 10^{-7} Amperes to 10^{-7} Amperes.

4,885,066

ELECTROLYTIC FINISHING METHOD

Youhei Kuwabara, Fukuroi, and Teruo Asaoka, Kakegawa, both of Japan, assignors to Shizuoka Seiki Co., Ltd., Fukuroi, Japan

Filed Sep. 16, 1988, Ser. No. 245,422

Claims priority, application Japan, Sep. 17, 1987, 62-233518; Sep. 17, 1987, 62-233519

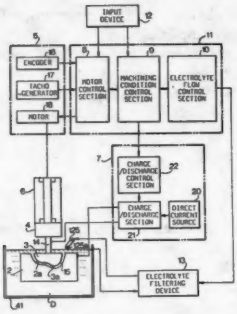
Int. Cl.[4] B23H *3/02, 7/18*

U.S. Cl. 204—129.43 **6 Claims**

1. A method for finishing a work comprising the steps of:

securing the work in an electrolytic tank;

positioning an electrode to form a predetermined gap between the electrode and the surface of the work;
supplying electrolyte to the electrolyte tank so as to submerge the electrode and the work;
applying pulses to the electrode;
supplying clean electrolyte to the gap and discharging the electrolyte including residual products;



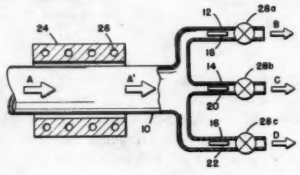
setting a reference peak current density between 30 A/cm^2 and 50 A/cm^2;
applying a pulse having a pulse duration between 2 msec and 10 msec at each pulse application to the electrode; and
controlling the peak current of the pulse to the reference peak current.

4,885,067

IN-SITU GENERATION OF VOLATILE COMPOUNDS FOR CHEMICAL VAPOR DEPOSITION

Fred P. Doty, Earlysville, Va., assignor to Santa Barbara Research Center, Goleta, Calif.

Continuation of Ser. No. 91,227, Aug. 31, 1987, abandoned. This application May 15, 1989, Ser. No. 355,050
Int. Cl.[4] C23C *16/00*
U.S. Cl. 204—157.6 **20 Claims**



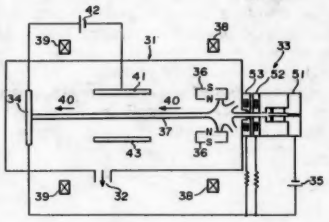
1. A method of generating a volatile organic compound for use in a CVD system, comprising the steps of:
providing a source of organic molecules;
introducing the molecules into a predetermined region of a process pipe coupled to the system;
disassociating the molecules within the predetermined region to generate free radicals therefrom;
passing the radicals over a solid source of material, the material being a material desired to be deposited within the system, the
directing the volatile compound into a portion of the system wherein the volatile compound is decomposed and the material is deposited.

4,885,068

SHEET PLASMA SPUTTERING METHOD AND AN APPARATUS FOR CARRYING OUT THE METHOD

Joshin Uramoto, Aichi; Koichi Suzuki; Takuji Oyama, and Hiroyasu Kojima, all of Yokohama, Japan, assignors to Joshin Uramoto, Aichi and Asahi Glass Company, Ltd., Tokyo, both of, Japan

Filed Sep. 9, 1988, Ser. No. 242,213
Int. Cl.[4] C23C *14/34, 14/46*
U.S. Cl. 204—192.11 **8 Claims**



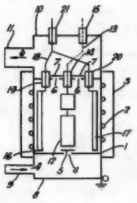
2. A sheet plasma sputtering apparatus which comprises a vacuum chamber, a pumping system, an arc discharge type plasma source, a first d.c. power source to produce an arc plasma stream from said plasma source, a first magnetic field producing means to provide a magnetic field to deform said arc plasma stream into a form of sheet plasma, an anode to form an arc discharge in association with said plasma source, a second magnetic field producing means to form a magnetic field which effectively guides said plasma stream deformed in a form of sheet plasma to said anode, a target arranged along said sheet plasma, a second d.c. power source to maintain an electric potential on said target to be negative to said sheet plasma, whereby a coating layer is formed on a substrate arranged opposite said target with respect to said sheet plasma by depositing particles sputtered from said target.

4,885,069

COATING IMPROVEMENTS

Joseph P. Coad, Uffington; David S. Rickerby, Wantage, and Philip Warrington, Harwell, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 879,651, Jun. 27, 1986, abandoned. This application Dec. 18, 1987, Ser. No. 149,438
Claims priority, application United Kingdom, Jul. 1, 1985, 8516580; Nov. 1, 1985, 8526948
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.31 **7 Claims**



1. A method of forming a coating on a metal substrate by sputter ion plating comprising generating a glow discharge under vacuum conditions in the presence of the substrate and of a cathode constituted by the coating material thereby to release atoms of material at the cathode by ion bombardment, some at least of which atoms are ionised and are attracted to

the substrate to form the coating thereon, by sputter ion plating and, during formation of said coating, applying an AC bias potential to the substrate such that the substrate has a negative potential for part only of the time during which coating is taking place such that ion polishing occurs in the negative part of the AC cycle and retention of coating material in the positive part thereof.

4,885,070

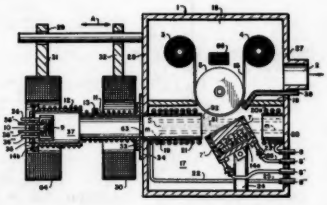
METHOD AND APPARATUS FOR THE APPLICATION OF MATERIALS

Gregor A. Campbell, Glendale; Robert W. Conn, Los Angeles; Dan M. Goebel, Santa Monica, all of Calif.; Rolf Adam; Hans Aichert, both of Hanau, Fed. Rep. of Germany; Hans Betz, Bruchkoebel, Fed. Rep. of Germany; Anton Dietrich, Wiesenfeld, Fed. Rep. of Germany; Gonde Dittmer, Burscheid, Fed. Rep. of Germany; Klaus Hartig, Ronneburg, Fed. Rep. of Germany; Friedrich Hass, Rodenbach, Fed. Rep. of Germany; Rainer Ludwig, Karlstein-Bettingen; Max Mayr, Alzenau-Wasserlos, Fed. Rep. of Germany, and Alfred Thelen, Wehrheim, Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 155,206, Feb. 12, 1988, abandoned. This application May 20, 1988, Ser. No. 197,040

Int. Cl.[4] C23C *14/46*

U.S. Cl. 204—192.11 **46 Claims**



33. Sputter coating method which comprises:

(a) providing a vacuum chamber and a plasma beam generator which communicates with the interior of the vacuum chamber;

(b) providing target means and substrate holder means in the vacuum chamber, said holder means presenting a substrate to be coated with sputtered particles;

(c) magnetically directing the plasma beam to the surface of the target means;

(d) accelerating ions in the plasma beam striking the surface of the target means to form sputtered particles; and

(e) diverting a portion of the plasma beam to the substrate.

4,885,071

APPARATUS FOR CONTINUOUS ELECTROLYTIC TREATMENT OF METAL STRIP AND SEALING STRUCTURE FOR ELECTROLYTIC CELL THEREFOR

Shinjiro Murakami, Okayama, Japan, assignor to Kawasaki Steel Corp., Japan

Filed Mar. 14, 1988, Ser. No. 167,400

Claims priority, application Japan, Mar. 17, 1987, 62-61997

Int. Cl.[4] C25D *17/00*

U.S. Cl. 204—206 **18 Claims**

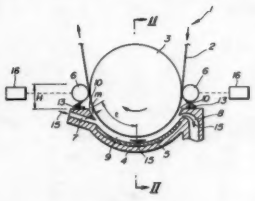
1. An electrolytic treatment apparatus comprising:

a rotary drum having an outer periphery on which a metal strip is wrapped;

means defining an eletrolytic cell in the vicinity of said outer periphery of said rotary drum, through which said metal strip is fed, said electrolytic cell defining an inlet opening through which said metal strip enters into said cell and an outlet opening through which said metal strip is fed out of said cell;

means for discharging electrolyte at a controlled pressure into said electrolytic cell, said electrolyte discharging means being so oriented as to establish a counter flow of electrolyte in a direction opposite to the feed direction of said metal strip;

means for sealing said inlet and outlet openings of said electrolytic cell, said sealing means comprising a seal roll opposing said metal strip surface and biased thereagainst



for establishing sealing contact therewith, a sealing lip member arranged to sealingly contact with said seal roll surface for establishing a liquid tight seal with said seal roll, and a flow resistance member disposed between said discharging means and said seal roll for providing a resistance zone located in the vicinity of said outlet where static pressure is established for service as resistance against flow of electrolyte.

4,885,072

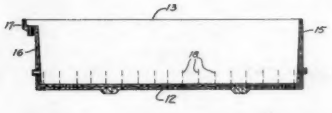
CONTAINER FOR CORROSIVE ELECTROLYTE

John O. Harry, P.O. Box 10386, Green Bay, Wis. 54307, and George Verhagen, 1767 Asbury Cir., Green Bay, Wis. 54303

Filed Oct. 4, 1988, Ser. No. 253,045

Int. Cl.[4] C25B *9/00;* **C25C** *7/00;* **B65D** *85/84;* **B28B** *1/14*

U.S. Cl. 204—279 **18 Claims**



1. A container for a corrosive electrolyte used in an electrolytic process, said container consisting of a cured mixture of 10% to 19% by weight of a resin taken from the group consisting of vinylester and polyester thermosetting resin modified by the addition of a thinning agent and the balance consisting of crystalline silica particles and particles taken from a group consisting of glass beads and mica flakes.

4,885,073

ACTIVATED CARBON ANODE INCLUDING LITHIUM

Yao Guangchun; Qiu Zhuxian, both of Shenyang, and Nu Z. Wu, Shandong, all of China, assignors to Northeast University of Technology, Liao and Shandong Aluminum Works, Shandong, both of, China

Filed Dec. 30, 1988, Ser. No. 292,383

Claims priority, application China, Jan. 6, 1988, 88100103

Int. Cl.[4] C25C *7/00, 3/12*

U.S. Cl. 204—291 **6 Claims**

1. In an aluminum electrolysis cell for the electrolytical production of aluminum, an activated carbon anode including at least one of the group consisting of a Soderberg anode and a prebaked anode comprising:

0.1–1.5% lithium compound by weight based upon the corresponding weight of lithium carbonate;

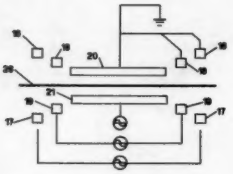
17–30% coal pitch by weight; and

68.5–82.9% coke by weight.

4,885,074
PLASMA REACTOR HAVING SEGMENTED ELECTRODES

Robin A. Susko, Owego, and James W. Wilson, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 18,233, Feb. 24, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 342,658
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—298 12 Claims

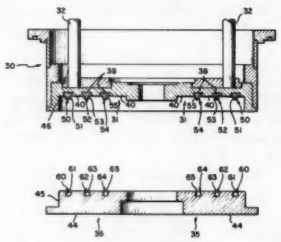


1. A plasma processor, comprising:
a reactor chamber capable of sustaining a vacuum;
a means for mounting a workpiece;
a first imperforate electrode moveably disposed within the reactor chamber in operative relationship to the means for mounting, and occupying a first plane substantially parallel to the workpiece said first plane located at a first distance from said workpiece;
a second imperforate electrode moveably disposed within the reactor chamber and at least partially surrounding the perimeter of the first electrode, and occupying a second plane substantially parallel to the workpiece said second plane located at second distance not equal to said first distance; and
a first and a second means for energizing the first and second electrodes, respectively, to initiate and maintain a plasma region such that the plasma distribution across the workpiece is uniform.

4,885,075
COOLING DEVICE FOR A SPUTTER TARGET AND SOURCE

Gary Hillman, Livingston, N.J., assignor to Machine Technology, Inc., Parsippany, N.J.

Continuation of Ser. No. 7,743, Jan. 27, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 290,882
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—298 36 Claims

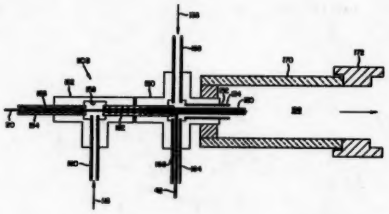


1. An assembly for use in a deposition apparatus, comprising a source of material to be deposited having a surface, a cathode having a surface disposed in contact with the surface of said source, and coupling means comprising at least one annular member or segment thereof disposed between said cathode and said source, said annular member or segment thereof extending into a corresponding recessed region within one of said surfaces, said recessed region bound by a recessed wall surface arranged normal to said surface of said source and said cathode, said annular member or segment thereof having an upstanding wall surface extending into said recessed region and arranged parallel to said recessed wall surface, said upstanding wall surface engaging said recessed wall surface within said recessed region upon expansion of said source upon radial heating thereof for increasing the thermal coupling between said cathode and said source and for thermally securing said source to said cathode during the operation of said cathode.

4,885,076
COMBINED ELECTROPHORESIS-ELECTROSPRAY INTERFACE AND METHOD

Richard P. Smith; Harold R. Udseth, both of Richland, Wash., and Jose A. Olivares, North Augusta, S.C., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Apr. 5, 1988, Ser. No. 178,046
The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.
Int. Cl.[4] B01D *59/44*
U.S. Cl. 204—299 R 21 Claims



1. A method of producing high resolution analyte separations capable of being analyzed by numerous analytical detectors, which comprises:
providing a source of an analyte sample solution and a source of a sheath electrode liquid;
electrophoretically separating said analyte sample solution to form a high resolution analyte eluent;
discharging the separated analyte eluent and the sheath electrode liquid in adjoining flows;
electrospraying an electrically-charged spray containing the separated analyte eluent and the sheath electrode liquid.

4,885,077
COMPOSITE MEMBRANE, METHOD FOR ITS PREPARATION AND ELECTROLYTE SENSOR INCLUDING SAME

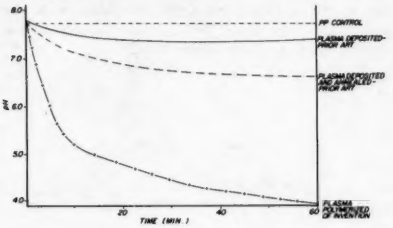
Mutlu Karakelle, Dayton, Ohio, and Richard J. Zdrahala, Miami Lakes, Fla., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 17, 1988, Ser. No. 272,372
Int. Cl.[4] G01N *27/40*
U.S. Cl. 204—403 24 Claims

1. A method for preparing a hydrophilic ion permeable membrane comprising:
(a) steeping a polyolefinic base screen membrane filter having a pore therethrough in a bath of a monomer of a hydrophilic polymer whereby a coating of said monomer forms on said base membrane and a wall of said pore, and said monomer permeates into, the matrix of said base membrane;
(b) removing said base membrane having said coating thereon from said bath and
(c) treating said based membrane having said coating of monomer thereon with a plasma whereby said monomer is

polymerized to a crosslinked hydrophilic polymer thereby rendering said membrane hydrophilic and ion permeable.

9. A hydrophilic ion permeable screen membrane filter comprising a polyolefinic base membrane having a pore therethrough and a coating of an interpenetrating polymeric network type crosslinked hydrophilic polymer on said base membrane and on a wall of said pore, said polymer being selected from the group consisting of polyacrylic acid, polyhy droxyethylacrylate and polyvinylpyrrolidone, said membrane having a hydrogen ion diffusion constant of greater than 7.8×10^{-10}.



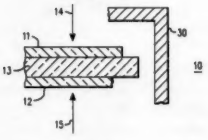
24. A sensor for blood analysis comprising a sensing element which includes a field effect transistor sensitive to the pH of a blood stream and a composite membrane having a hydrogen ion diffusion constant of greater than 7.8×10^{-10} comprising a polypropylene base screen membrane filter having a pore therethrough and a coating of an interpenetrating polymeric network type crosslinked polyacrylic acid on said base membrane and on a wall of said pore, said composite membrane being permeable to hydrogen ions in a blood stream but impermeable to other components of said blood stream, said transistor being capable of generating a detectable signal consequent to contact with said hydrogen ions.

4,885,078

DEVICES CAPABLE OF REMOVING SILICON AND ALUMINUM FROM GASEOUS ATMOSPHERES

Charles J. Spengler, and Prabhakar Singh, both of Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1988, Ser. No. 280,911
Int. Cl.[4] G01N *27/26*; H01M *8/06*
U.S. Cl. 204—432 **12 Claims**



1. An electrochemical device, comprising a containment vessel and optional ceramic material within the containment vessel and including at least one electrochemical cell, the cell comprising a porous, exposed electrode in contact with a solid electrolyte, the improvement characterized in that at least one of the exposed electrode, the containment vessel, and the optional material within the containment vessel, contains a deposit selected from metal oxide and metal salt capable of forming metal oxide upon heating, where the metal is selected from the group consisting of Ce, Sm, Mg, Be, Ca, Sr, Ti, Zr, Hf, Y, La, Pr, Nb, Pm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Th, U, and mixtures thereof.

4,885,079

PROCESS FOR SEPARATING ORGANIC MATERIAL FROM PARTICULATE SOLIDS

Christopher P. Eppig, Cleveland Hts.; Stephen C. Paspek, North Royalton, and Richard B. Stalzer, Broadview Hts., all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 906,727, Sep. 12, 1986, abandoned. This application Mar. 7, 1989, Ser. No. 320,865
Int. Cl.[4] C10G *21/02*
U.S. Cl. 208—13 **57 Claims**

1. A process for separating hydrocarbon oil and heavy residual organics from a feed composition comprising solids intermixed with said hydrocarbon oil and heavy residual organics, said heavy residual organics having higher boiling points than said hydrocarbon oil, said process comprising the steps of:

(1) contacting said feed composition with a first hydrocarbon fluid of from 2 to about 9 carbon atoms for an effective period of time to extract at least part of said hydrocarbon oil from said feed composition and form a first separatable phase comprising said hydrocarbon oil and said first hydrocarbon fluid, and separating at least part of said first separatable phase from said feed composition to provide a first intermediate composition;

(2) contacting said first intermediate composition from step (1) with a second hydrocarbon fluid for an effective period of time to extract at least part of said heavy residual organics from said first intermediate composition and form a second separatable phase comprising said second hydrocarbon fluid and said heavy residual organics, said second hydrocarbon fluid being capable of dissolving at least part of said heavy residual organics at a temperature in the range of about 30° F. to about 400° F. and a pressure below about 500 psig, and separating at least part of said second separatable phase from said first intermediate composition to provide a second intermediate composition, at least part of said second hydrocarbon fluid remaining in said second intermediate composition; and

(3) contacting said second intermediate composition from step (2) with a third hydrocarbon fluid of from 2 to about 9 carbon atoms for an effective period of time to extract at least part of said second hydrocarbon fluid from said second intermediate composition and form a third separatable phase comprising said third hydrocarbon fluid and said second hydrocarbon fluid, and separating at least part of said third separatable phase from said second intermediate composition to provide a treated product.

4,885,080

PROCESS FOR DEMETALLIZING AND DESULFURIZING HEAVY CRUDE OIL

Ronald E. Brown; Robert J. Hogan, both of Bartlesville, Okla.; Daniel M. Coombs, Borger, Tex., and Simon G. Kukes, Naperville, Ill., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 25, 1988, Ser. No. 198,767
Int. Cl.[4] C10G *31/00*
U.S. Cl. 208—218 **23 Claims**

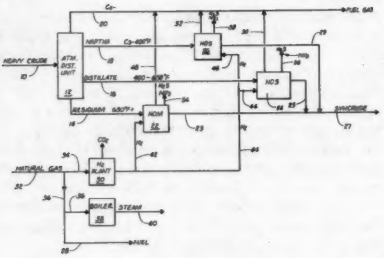
1. A process for producing a synthetic crude oil of improved properties by desulfurizing, denitrogenating and demetallizing a heavy crude oil feed stock, said feed stock being a crude oil having an average boiling point at least as high as 500° F., an °API gravity at 60° F. of less than 20, and containing at least about 1 weight percent sulfur, which process comprises:

separating said heavy crude oil feed stock into four fractions including an atmospheric residuum fraction having an initial boiling point at least as high as 650° F., a distillate fraction having a boiling range of from about 400° F. to about 650° F., a naphtha fraction having a boiling range of from about that of C_5 hydrocarbons to about 400° F., and a light hydrocarbon gas overhead containing predominantly hydrocarbon gases;

contacting the distillate fraction with a desulfurization cata-

lyst, and with hydrogen gas, in a first hydrodesulfurization zone under conditions of temperature, hydrogen partial pressure, hydrogen flow rate, catalytic activity and space velocity such as to remove a substantial portion of the sulfur and nitrogen from the distillate fraction;

concurrently with such contacting of the distillate fraction, contacting at least a substantial portion of said residuum fraction with hydrogen gas in the presence of a hydrodemetallation catalyst also having hydrodesulfurizing



activity, in a hydrodemetallation zone under conditions of temperature, hydrogen partial pressure, hydrogen flow rate, and space velocity such that a major portion of the nickel and vanadium metal content of the residuum is removed therefrom, and a substantial potion of the sulfur content of the residuum is concurrently removed therefrom; then

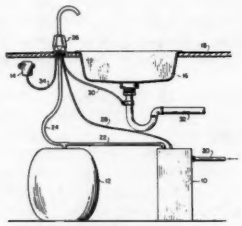
recombining the naphtha fraction, the hydrotreated distillate, and the hydrotreated residuum fractions to yield an improved, synthetic crude oil.

4,885,081

DRINKING WATER DELIVERY SYSTEM WITH PURITY INDICATOR

Bruce J. Oliver, Las Vegas, Nev., assignor to Aquest, Inc., Las Vegas, Nev.

Continuation of Ser. No. 912,584, Sep. 29, 1986, abandoned, which is a continuation of Ser. No. 703,137, Feb. 19, 1985, Pat. No. 4,623,451. This application Oct. 7, 1987, Ser. No. 107,861
The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.
Int. Cl.[4] C02F *1/44*
U.S. Cl. 210—87 **7 Claims**



1. A drinking water delivery system for connection to a purification apparatus that receives water from a source and treats the water to remove an amount of unwanted substances from the water, comprising:

a pure water line connectable at a first and thereof to the purification apparatus for conveying treated water therefrom;

faucet means connected to a second end of the pure water line and being manually operable from an OFF condition to an ON condition for dispensing the treated water;

means for providing a visual or audible signal to a person when energized;

a switch actuated in response to the ON condition;

a pair of electrodes;

means for mounting the electrodes for contacting the treated water conveyed through the pure water line; and

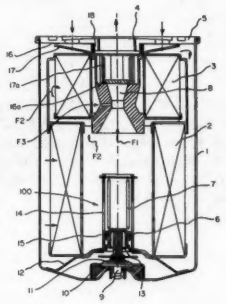
circuit means connecting the switch, the electrodes and the signal providing means for charging the electrodes to thereby determine a level of purity of the treated water being dispensed only during the ON condition, and for thereafter energizing the signal providing means only when the treated water has a level of purity above or below a predetermined target purity level.

4,885,082

MULTIPLE LUBRICATING OIL FILTER FOR INTERNAL COMBUSTION ENGINES, WITH A MEMBER FOR MONITORING THE DEGREE OF CLOGGING OF THE FILTRATION SURFACE

Angelo Cantoni, Rome, Italy, assignor to Ital Idee s.r.l. an Italian Limited Liability Company, Rome, Italy

Filed Apr. 11, 1988, Ser. No. 179,872
Claims priority, application Italy, Apr. 13, 1987, 47839 A/87
Int. Cl.[4] B01D *35/14*
U.S. Cl. 210—90 **5 Claims**



1. A multiple lubricating oil filter for internal combustion engines, with a member for monitoring the degree of clogging of the filtration surface, comprising:

a casing provided with an end cover having means for connection to an engine lubrication circuit;

a first filter pack placed inside said casing and positioned so as to be passed through by engine lubricating oil;

a pressure relief valve arranged so as to allow the lubricating oil to bypass the first filter pack when an excessive pressure drop occurs, the pressure relief valve including a non-conducting piston element which rests on an electrically conducting spring arranged so as to establish an electrical point of contact between the spring and a metal electrical contact connected to a part of the filter casing; and

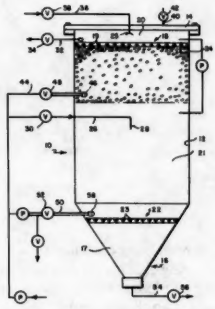
a second filter pack being positioned inside said casing to filter part of the oil which the pressure relief valve allows to pass when the first filter pack is clogged.

4,885,083

SINGLE CHAMBER FILTER VESSEL

James V. Banks, 73 Rockford St., Brockton, Mass. 02401

Continuation of Ser. No. 85,320, Aug. 10, 1987, abandoned, which is a continuation of Ser. No. 891,581, Aug. 1, 1986, abandoned. This application Aug. 29, 1988, Ser. No. 240,395
Int. Cl.[4] B01D *29/08*
U.S. Cl. 210—108 13 Claims



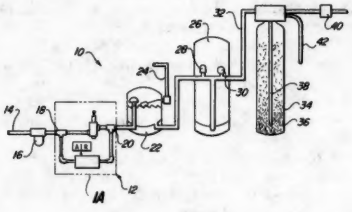
1. A filter vessel comprising means defining a closed chamber, a fluid discharge opening at the top of the chamber containing a fluid discharge valve, a solids discharge opening at the bottom containing a solids discharge valve, a first grid adjacent the top but spaced therefrom defining with the top a fluid discharge chamber, a second grid adjacent the bottom but spaced therefrom defining in conjunction with the first grid a filter chamber and with the bottom a solids discharge chamber, a bed of buoyant material disposed in the filter chamber between the first and second grids defining a filter bed, a first conductor for delivering fluid to be filtered into the filter chamber below the filter bed for flow upwardly through the filter bed, a second conductor located in the filter chamber for delivering wash fluid for rehabilitation to dislodge solids contained in the filter bed and means adjacent the upper side of the second grid for constantly clearing the solids deposited on the second grid to prevent accumulation of the solids thereon and promote passage of the solids through the second grid into the solids discharge chamber below the second grid.

4,885,084

NOZZLE/VENTURI WITH PRESSURE DIFFERENTIATING BYPASS

Lorin G. Doyle, Ashland, Ohio, assignor to Flint & Walling, Inc., Kendallville, Ind.

Filed Jun. 22, 1988, Ser. No. 209,828
Int. Cl.[4] C02F *1/74*
U.S. Cl. 210—132 28 Claims



17. A system for removing contaminants from water comprising:

means for entraining air into the water, said means including a selectively adjustable pressure differentiating bypass valve for controlling the pressure differential between an inlet and an outlet of said means to continuously adjust the amount of air entrained into the water under varying water flow rates and pressures across said means;

an aeration tank having an inlet fluidly communicating with said air entraining means, said aeration tank including vent means to release gases; and

a filter tank having a filter medium and fluidly communicating with said aeration tank, the water passing through said filter medium to filter contaminants from the water, the filtered water being delivered to service;

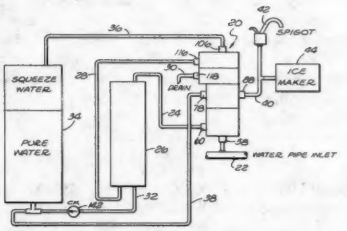
said bypass valve including adjustably biased valving means to selectively control the water flow through said bypass valve and said air entraining means to selectively control the air entrained into the water.

4,885,085

DIRECT ACTING REVERSE OSMOSIS WATER PURIFIER VALVES

Richard W. Beall, Jr., 229 4th Pl., Manhattan Beach, Calif. 90266

Filed Aug. 12, 1988, Ser. No. 231,722
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—137 11 Claims



1. A reverse osmosis water purifier system comprising:

a reverse osmosis water purifier element having an inlet means for pressurized tap water, first outlet means for waste water and second outlet means for pure water;

a pressure resistant storage tank having a flexible bladder therein dividing the tank into a pure water chamber and a squeeze water chamber and having a pure water connection and a squeeze water connection to said pure water and squeeze water chambers, respectively;

first valve means for coupling between a source of water under pressure, said squeeze water connection on said storage tank and a drain line, said first valve means being a means for coupling said source of water under pressure to said squeeze water connection when pure water is to be used, and for coupling said squeeze water connection to said drain line when pure water is being accumulated in said storage tank;

a flow restriction between said first outlet means of said reverse osmosis water purifier element and a drain line;

means for coupling to a pressurized tap water supply;

second valve means coupled between said means for coupling to a pressurized tap water supply and said inlet means of said reverse osmosis water purifier element for controlling the flow of water therebetween responsive to the pressure of pure water from said storage tank, said second valve means being a single first diaphragm valve having a valve seat having a central region circumscribed by said valve seat and a peripheral region surrounding said valve seat, one of said central and peripheral regions being in fluid communication with said means for coupling to a pressurized tap water supply, and the other of said regions being in fluid communication with said inlet means of said reverse osmosis water purifier element, said second valve means also having a diaphragm having first and second

sides thereof, said diaphragm being supported so that said first side thereof is adjacent said valve seat, said second side of said diaphragm being in fluid communication with pure water from said storage tank and responsive to the pressure thereof; and

means for maintaining pure water pressure in at least part of said purifier system including that which is in fluid communication with said second side of said diaphragm when said second valve means is closed;

said second valve means includes means for beginning to close as the pure water pressure approaches the tap water pressure, for being self actuating to completely close as flow through said flow restriction reduces the pressure in the inlet means of the reverse osmosis water purifier element.

8. A valve assembly for use in a reverse osmosis water purifier system comprising:

a first diaphragm valve means for responding to pure water pressure from a storage tank to shut off the supply of tap water when the pure water pressure approaches tap water pressure;

a second diaphragm valve means for acting as a check valve to maintain pressure in a pure water outlet line when the pure water pressure from a storage tank decreases;

a third diaphragm pilot valve means responsive to pure water pressure in the pure water outlet line; and

a forth diaphragm valve responsive to said pilot valve means for controlling squeeze water in a pure water storage tank;

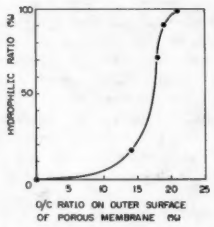
at least one of said first diaphragm valve means and said third diaphragm pilot valve means being a single diaphragm valve.

4,885,086

HYDROPHILIC MICROPOROUS MEMBRANE AND PROCESS FOR PREPARING SAME

Morikazu Miura, Yokohama, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 20, 1988, Ser. No. 221,573
Claims priority, application Japan, Jul. 27, 1987, 62-187037
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—321.8 **8 Claims**



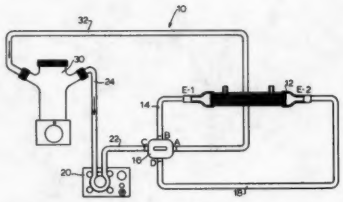
1. A hollow fiber microporous membrane comprising a polyolefin having a polyvinyl alcohol chemically bonded to the inner and outer surfaces of the hollow fiber membrane and the surfaces defining the pores thereof sufficient to provide a weight loss of not greater than 0.1% if the microporous membrane is washed with hot water at a temperature of higher than 80° C., and having an average pore diameter of 0.01 to 5 μm and a porosity of 20 to 80%, wherein the polyvinyl alcohol-polyolefin composition ratio is constant in the membrane thickness direction of the hollow fiber, the oxygen/carbon atomic ratio X on the outer surface of the hollow fiber microporous membrane is 10 to 50%, and the condition defined by the ratio $X/2 \geqq Y$ is satisfied between said oxygen/carbon atomic ratio X and the oxygen/carbon atomic ratio Y in the entire microporous membrane.

4,885,087

APPARATUS FOR MASS TRANSFER INVOLVING BIOLOGICAL/PHARMACEUTICAL MEDIA

Henry B. Kopf, 208 Coatbridge Cir., Cary, N.C. 27511

Filed Nov. 26, 1986, Ser. No. 936,486
Int. Cl.[4] B01D *13/00*; C12N *5/00*
U.S. Cl. 210—321.72 **17 Claims**



1. A mass transfer apparatus comprising:

(a) a first pump having discharge and inlet ports;

(b) means defining an elongated mass transfer chamber having first and second opposite ends with at least one mass transfer surface element in said chamber having first and second sides defining respective first and second passages, said first passage(s) on said first side of said element(s) communicating with said first and second ends for flow of a first medium through said first passage(s) in mass transfer relationship with a second medium in said second passage(s) on said second side of said element(s);

(c) a reservoir having inlet and outlet ports;

(d) means for alternatingly switching the direction of flow of said first medium through said first passage(s), between a first mode in which said flow of said first medium is from the first end through said first passage(s) to the second end, and a second mode in which said flow of said first medium is from the second end through said first passage(s) to the first end, including switchable flow control means comprising flow ports designated A, B, C, and D, for connecting:

(1) in a first configuration, port A in flow communication with port B, and port C in flow communication with port D; and

(2) in a second configuration, port A in flow communication with port D, and port B in flow communication with port C; and

(e) conduits connecting the pump discharge port to said port C, the pump inlet to the reservoir outlet port, the reservoir inlet port to the port A, the chamber first end to the port B and the chamber second end to the port D.

4,885,088

FILTER BELT PRESS

Johann Sbaschnigg, Graz, Austria, assignor to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Filed Dec. 18, 1986, Ser. No. 944,388
Claims priority, application Austria, Dec. 19, 1985, A3677/85
Int. Cl.[4] B01D *33/04*
U.S. Cl. 210—400 **54 Claims**

1. A filter belt press for separating solid matter from material suspensions, comprising:

an upper roller-guided filter belt including a substantially horizontally arranged part;

a lower roller-guided filter belt including a substantially horizontally arranged part;

means for moving the upper and lower filter belts in a chosen direction;

the substantially horizontally arranged part of the upper filter belt and the substantially horizontally arranged part of the lower filter belt defining therebetween a wedge-shaped space converging in a moving direction

of the belts, a widest portion of the wedge-shaped space being adjacent a material-introducing side of the press, and a narrowest portion of the wedge-shaped space being adjacent a material-exiting side of the press;

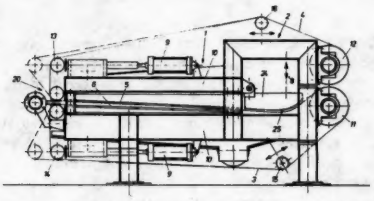
an upper filter plate arranged above the upper belt, for guiding and supporting the upper belt over at least a portion of the substantially horizontally arranged part of the upper belt;

a lower filter plate arranged below the lower belt, for guiding and supporting the lower belt over at least a portion of the substantially horizontally arranged part of the lower belt;

a first dehydrating zone, including the upper filter belt, the lower filter belt, the wedge-shaped space, the upper filter plate and the lower filter plate, the first dehydrating zone defining a horizontal plane;

a second dehydrating zone, disposed in the moving direction immediately following the first dehydrating zone on substantially the same horizontal plane, including:

a dehydrating shoe having:



a head proximate the material-introducing side of the press at an end of the narrowest portion of the wedge-shaped space;

a pressing surface including a convexly curved surface section disposed proximate the material-exiting side of the press, facing and guiding together the upper and lower filter belts;

a shoe end adjacent the material-exiting side of the press;

a pivotal adjustable support for supporting the shoe;

pressure adjusting means for pressing the convexly curved surface section of the dehydrating shoe against the upper and lower filter belts; and

means for applying and varying a force between the pressing surface and the upper and lower filter belts;

whereby the pressing surface is situated on substantially a common level with the material-exiting side of the press and includes means for producing a continuously rising force against exiting material present between the upper and lower filter belts.

4,885,089

LIQUID DISTRIBUTOR CAP FOR A FILTER CARTRIDGE

Heinz Hankammer, Taunusstein, Fed. Rep. of Germany, assignor to Brita Wasser-Filter-Systeme GmbH, Fed. Rep. of Germany

Filed Aug. 19, 1987, Ser. No. 86,998

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628029

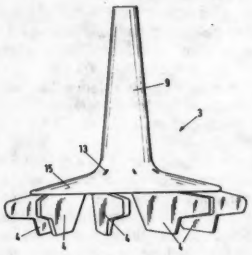
Int. Cl.[4] B01D *35/04*

U.S. Cl. 210—420 **16 Claims**

1. A liquid distributor for a generally cylindrical filter cartridge (1) used to filter water for drinking purposes, the cartridge having a latitudinal axis and containing a quantity of filter material and also having an entrance screen (2) at one end thereof through which water enters the cartridge;

the distributor comprising an essentially closed distributor cap (3) adapted for mounting over one end of the cartridge around the axis and covering the screen;

said cap having a bottom section (15) including flow directing upper and lower surfaces which are symmetrical about the axis and are constructed and arranged to direct flow of



liquid along said upper surfaces to the sides of the cartridge and between the screen and said lower surface so as to enter the filter cartridge through a space between the screen and lower surface of said cap; and

means defining a venting duct (11) extending through said bottom section.

4,885,090

SCREEN PLATES

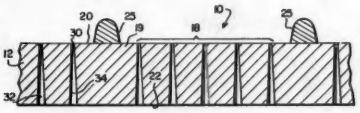
David E. Chupka, Middletown, Ohio, and Carl C. Landegger, New York, N.Y., assignors to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 81,771, Aug. 5, 1987, Pat. No. 4,795,560, which is a continuation-in-part of Ser. No. 39,391, Apr. 16, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 217,492

The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.

Int. Cl.[4] B01D *39/10*

U.S. Cl. 210—497.01 **7 Claims**



1. In a metal cylindrical screen plate for use in pressure screening of papermaking stock for removing contaminant particles therefrom in pressure screening apparatus, in which said screen plate is provided with an inlet surface, an outlet surface, and has a plurality of closely spaced openings leading from said inlet surface to said outlet surface, and defining land areas on said inlet surface between adjacent openings, and further has a plurality of wear bars positioned on said inlet surface in spaced relation with respect to each other for coaction with a rotating foil portion of said pressure screening apparatus, the improvement comprising the fact that said wear bars are formed by beads of weld material applied on said inlet surface exclusively on said land areas and in nonintersecting relation to said openings.

4,885,091

PROCESS FOR THE PREPARATION OF CHLORINE-RESISTANT SEMIPERMEABLE MEMBRANES

Raymond J. Swedo, Mt. Prospect, and Joseph J. Zupancic, Bensenville, both of Ill., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 898,074, Aug. 20, 1986, Pat. No. 4,772,394, which is a continuation-in-part of Ser. No. 686,497, Dec. 26, 1989, abandoned. This application Jun. 1, 1988, Ser. No. 202,850

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] B01D *13/00, 13/04*

U.S. Cl. 210—500.37 29 Claims

1. A process for the preparation of a chlorine-resistant semipermeable membrane which comprises providing resistance to chlorine in desalination of saline water by casting a solution of an aromatic polyamine containing a chlorine substituent on the aromatic ring selected from the group consisting of 4-chloro-m-phenylenediamine, 5-chloro-m-phenylenediamine and mixtures thereof on a porous support backing material, removing excess solution, contacting said coated support material with an organic solvent solution of an aromatic polycarboxylic acid chloride to form an interfacial condensation reaction product membrane on the surface of said porous backing material, curing the resultant composite at curing conditions which include a temperature in the range of from about 25° to about 150° C. for a period of time in the range of from about 10 minutes to about 2 hours, and recovering the resultant chlorine-resistant semipermeable membrane.

4,885,092

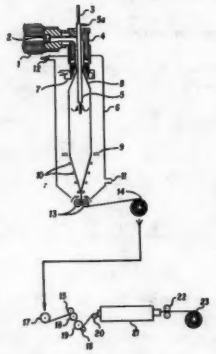
PROCESS FOR THE MANUFACTURE OF ASYMMETRIC, POROUS MEMBRANES AND PRODUCT THEREOF

Maurice M. Zwick, Stamford, Conn., assignor to American Cyanamid, Stamford, Conn.

Division of Ser. No. 842,740, Mar. 24, 1986, Pat. No. 4,865,785. This application Feb. 17, 1989, Ser. No. 310,995

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—500.41 5 Claims



1. A porous, asymmetric polymer membrane having two surfaces one of which is denser than the other, said surfaces being biaxially oriented by stretching each at least about 200%, the variation in longitudinal and latitudinal orientation not varying more than about 25%, said membrane exhibiting a porosity gradient across its thickness with void spaces generally decreasing in at least one of size and number in the direction of the denser surface and the density of said surface being such that the permeability/impermeability characteristics enable chemical separations be achieved, the biaxial orientation of said membrane having been provided thereto before or during development of said porosity gradient.

4,885,093

METHOD FOR PURIFICATION OF PHOSPHATE-CONTAINING SEWAGE

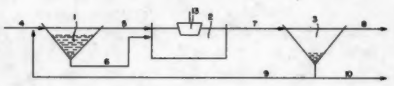
Rainer Schoenberger, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 30, 1987, Ser. No. 139,535

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1986, 3644770

Int. Cl.[4] C02F *3/30*

U.S. Cl. 210—605 14 Claims



1. In a process for the purification of phosphate-containing sewage with biological phosphorus elimination, in which the settleable and/or nonsettleable seewage components are treated with activated sludge in successive treatment tanks first under anaerobic and then under aerobic conditions and in which an activated return sludge is fed back from an aerobic stage comprising an aerated activated sludge tank and a secondary settling tank into the tank operating under anaerobic conditions, the improvement comprising conducting the treatment under anaerobic conditions in a settling tank, in which the sludge detention period exceeds the hydraulic detention period.

4,885,094

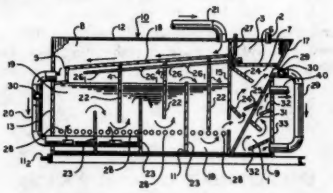
ANAEROBIC DIGESTION PROCESS, AND FORCED FED FAST RATE DIGESTER

Vadake R. Srinivasan, Baton Rouge, and Wilbur Monceaux, Youngsville, both of La., assignors to Micro Pure Systems, Inc., Lafayette, La.

Filed Mar. 9, 1988, Ser. No. 165,977

Int. Cl.[4] C02F *3/28*

U.S. Cl. 210—610 6 Claims



1. A process for producing on a continuous basis from a municipal waste comprising carbon, nitrogen and phosphrous and with a carbon: nitrogen ratio of less than about 5: a stabilized low solids sludge and clean effluent suitable for discharge to the environment which comprises adjusting and maintaining the temperature of the waste within a range of from about 30° C. to about 50° C., the pH of the waste within a range of from about 6.5 to about 8, adding a sugar-containing carbon source to the waste to maintain the carbon:nitrogen ratio of the waste within a range of from about 5:1 to about 10:1, maintaining the nitrogen:phosphorus ratio of the waste within a range of from about 3:1 to about 8:1, and fermenting the organic waste in the presence of an anaerobic microorganism, or mixture of anaero-

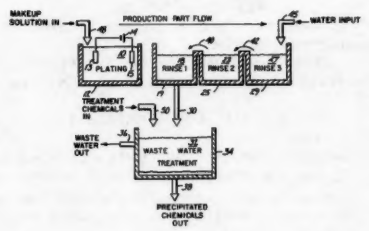
bic microorganisms, at anaerobic conditions, while providing a residence time up to about 72 hours.

4,885,095

SYSTEM FOR SEPARATING SOLUTIONS

Ronald R. Rich, Edina, Minn., assignor to Water Technologies, Inc., Eden Prairie, Minn.

Filed Apr. 3, 1987, Ser. No. 35,621
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—636 **41 Claims**



39. The method of concentrating an initial solution comprising the steps of:

(1) applying the solution to the feed input of a reverse osmosis unit during a first time period to provide a first concentrate at the concentrate output thereof and a first permeate at the permeate output thereof;

(2) collecting a supply of first concentrate; and

(3) disconnecting the feed input from the initial solution and connecting it to the supply of first concentrate during a second time period to provide a second concentrate at the concentrate output thereof and a second permeate at the permeate output thereof.

4,885,096

AROMATICS - NON-ARMOATICS SEPARATION BY PERMEATION THROUGH THERMALLY CROSSLINKED NITRILE RUBBER MEMBRANES

Laura E. Black, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 13, 1988, Ser. No. 205,720
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—640 **8 Claims**

1. A method for separating aromatic hydrocarbons from mixtures containing aromatic hydrocarbons and non-aromatic hydrocarbons, the method comprising selectively permeating the aromatic hydrocarbon through a membrane of polyconjugated diene rubber containing from 15 to 50 wt % nitrile groups said membrane being thermally crosslinked in the absence of any catalytic crosslinking agent.

4,885,097

STABILIZATION OF METAL IONS WITH TERPOLYMERS CONTAINING STYRENE SULFONIC ACID

Zahid Amjad, Avon Lake, and William F. Masler, Hinckley, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 938,896, Dec. 8, 1986. This application Aug. 23, 1988, Ser. No. 235,268
Int. Cl.[4] C02F *5/12*
U.S. Cl. 210—701 **22 Claims**

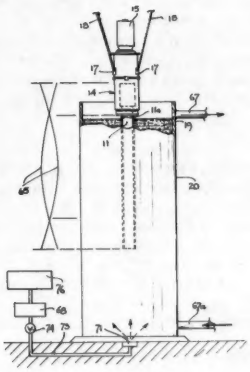
1. A method for maintaining metal ions in solution in an aqueous medium comprising adding to said aqueous medium an effective amount of a water-soluble copolymer for the purpose of maintaining said metal ions in solution, said copolymer consisting essentially of (a) 40–70% by weight carboxylic monomer selected from acrylic acid, methacrylic acid, salts of such acids, and mixtures thereof, (b) 10 to 50% by weight of a sulfonic monomer selected from 2-acrylamido-2-methylpropane sulfonic acid, 2-methacrylamido-2-methylpropane sulfonic acid, salts of said acids, and mixtures thereof, (c) 5 to 30% of primary copolymerizable comonomer selected from styrene sulfonic acid, salts of such acids, and mixtures thereof, and (d) up to 20% by weight of one or more secondary copolymerizable monomers which do not deleteriously affect performance of said copolymer, said secondary copolymerizable monomers exclude substituted acrylamides, vinyl esters, and vinyl acetate; said copolymer has weight average molecular weight in the range of about 1,000 to 100,000 and said metal ions are selected from iron, manganese, zinc, and mixtures thereof.

4,885,098

SONIC METHOD FOR FACILITATING THE REMOVAL OF SOLID PARTICLES FROM A SLURRY

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 128,454, Dec. 3, 1987, Pat. No. 4,780,138, which is a continuation of Ser. No. 923,575, Oct. 27, 1986, abandoned. This application Oct. 21, 1988, Ser. No. 263,040
The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.
Int. Cl.[4] B01D *21/00, 21/01*
U.S. Cl. 210—702 **3 Claims**



1. A method for facilitating the settling of solid particles from a liquid slurry comprising the steps of:

attaching an oscillator to one end of a bar member of an elastic material,

supporting said bar member suspended in tension in said liquid slurry without any sidewise support for freedom of lateral motion throughout substantially the entire extent of said bar member; and

driving said oscillator so as to cause cycloidal resonant standing wave vibration of said bar member to effect quadrature motion of said bar member throughout the longitudinal extent thereof,

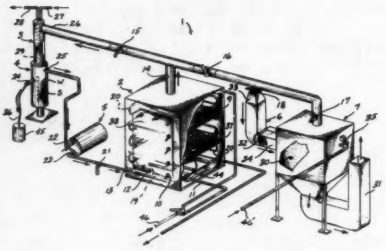
whereby sonic energy is transferred from said bar member to the slurry to set up force vectors therein both normal and tangential to said bar member thereby facilitating the agglomeration of the solid particles and engendering the settling of the particles from the slurry.

4,885,099

CLOSED SYSTEM SOLVENT STRIPPING AND RECLAIMING APPARATUS

George H. Kelly, Anchorage, Ak., assignor to J.A.C. Corporation, Anchorage, Ak.

Filed Oct. 31, 1986, Ser. No. 925,336
Int. Cl.[4] B01D *41/02;* B08B *7/04*
U.S. Cl. 210—771 19 Claims



8. A solvent stripping process for removing and reclaiming solvent from dry cleaning laden filters comprising the steps of:

(a) heating solvent laden filter material in an enclosure thereby vaporizing said solvent; then

(b) injecting water into the heated enclosure and vaporizing said water to enhance the removal of solvent from said filter material;

(c) thereafter forcing live steam into said enclosure to further enhance removal of solvent from said filter material;

(d) condensing solvent vapors and steam produced by the above steps into a liquid phase;

(e) separating the liquid phase into a solvent and a solvent contaminated water, thereby reclaiming said solvent; and

(f) passing dry gas through said filter material thereby stripping said filter material of remaining solvent.

4,885,100

TRIS(ISONITRILE)COPPER(I) ADDUCTS FOR PREPARING RADIONUCLIDE COMPLEXES

Tahir Iqbal, Lowell, Mass.; John H. Cain, Jr., Merrimack, N.H., and Jack J. Slosky, Shrewsbury, Mass., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 11, 1987, Ser. No. 95,924
Int. Cl.[4] C07F *13/00, 1/08;* C07C *119/02*
U.S. Cl. 252—1 11 Claims

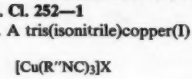
1. A tris(isonitrile)copper(I) complex of the formula

$$[Cu(R''NC)_3]X$$

wherein

X is an anion selected from BF_4, PF_6, ClO_4, I, Br, Cl and CF_3COO; and

R'' is alkyl of 1–20 carbon atoms or has the formula:



(I) (Ia)

wherein

A is a straight or branched chain alkylene group; and

R and R' each independently is a straight or branched chain alkyl group or taken together are a straight or branched chain alkylene group, provided that:

(1) the total number of carbon atoms in A plus R in formula (I) is 4 to 6, provided further that when the total number of carbon atoms is 6, then the carbon atom alpha to the isonitrile group is a quanternary carbon, and

(2) the total number of carbon atoms in A plus R plus R' in formula (Ia) is 4 to 9.

4,885,101

LAUNDRY DETERGENTS CONTAINING FABRIC-SOFTENING CLAYS BETWEEN 150 AND 2000 MICRONS IN SIZE

Ho T. Tai, Lambersart, France, assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 9, 1988, Ser. No. 269,384
Claims priority, application United Kingdom, Nov. 13, 1987, 8726675
Int. Cl.[4] C11D *3/12, 3/14, 17/06;* D06M *11/06*
U.S. Cl. 252—8.6 4 Claims

1. A detergent composition comprising a detergent active from 2 to 5% by weight of material, from 10 to 70% a detergency builder and a fabric softening clay material, characterised in that the clay material is ground clay having an average primary particle size of between 150 and 2000 microns.

4,885,102

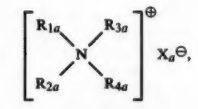
CLOTH-SOFTENING LIQUID COMPOSITION CONTAINING QUATERNARY AMMONIUM COMPOUND AND A POLYETHER DERIVATIVE OR CATIONIC SURFACTANT POLYMER

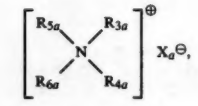
Masaaki Yamamura; Junichi Inokoshi; Tetuo Ito; Kazumitsu Furuta, all of Utsunomiya, and Kazuo Shimizu, Ichikai, all of Japan, assignors to Kao Corporation, Tokyo, Japan

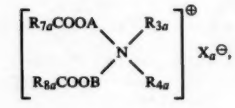
Filed Jun. 24, 1988, Ser. No. 211,352
Claims priority, application Japan, Jul. 17, 1987, 62-178549; Aug. 26, 1987, 62-212221
Int. Cl.[4] C11D *1/62;* D06M *13/46, 15/21*
U.S. Cl. 252—8.8 9 Claims

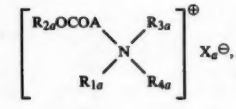
1. A cloth-softening, liquid composition, comprising:

(a) from 7 to 30 wt. % of a quaternary ammonium salt component selected from the group consisting of compounds of the formulas









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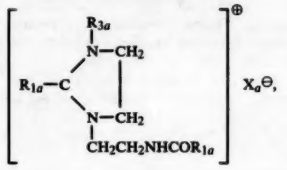
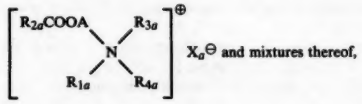


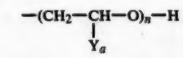


wherein

R_{1a} is C_8 to C_{22}, saturated or unsaturated, straight-chain or branched, aliphatic hydrocarbon group or hydroxy-substituted aliphatic hydrocarbon group,

R_{2a} is C_8 to C_{24}, saturated or unsaturated, straight-chain or branched, aliphatic hydrocarbon group or hydroxy-substituted aliphatic hydrocarbon group,

R_{3a}, R_{4a} and R_{6a} each is a C_1 to C_3 alkyl or hydroxyalkyl group or a group of the formula



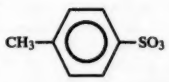
wherein n is an integer of 1 to 10 and Y_a is hydrogen or methyl,

R_{5a} is a C_{24} to C_{36}, saturated or unsaturated, branched aliphatic hydrocarbon group or hydroxy-substituted aliphatic hydrocarbon group,

R_{7a} and R_{8a} each is a C_7 to C_{21}, saturated or unsaturated, straight-chain or branched, aliphatic hydrocarbon group or hydroxy-substituted aliphatic hydrocarbon group,

A and B each is a C_1 to C_3 alkylene group, and

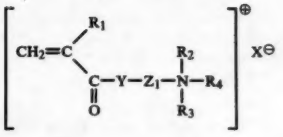
X_a is CH_3SO_4, $C_2H_5SO_4$, $C_nH_{2n+1}COO$ (wherein n is 0 to 17), $C_{n'}H_{2n'+1}OPO_3$ (wherein n' is 8 to 18), $HOCH_2COO$,



or halogen, (b) from 0.2 to 10 wt. % of

(I) a substance selected from the group consisting of (i) polyethers prepared by adducting ethylene oxide alone or both of ethylene oxide and propylene oxide to a compound having at least five active hydrogen atoms and which is selected from the group consisting of polyhydric alcohols, polyhydric phenols and polyamines, said polyether having a molecular weight of from 5,000 to 200,000 and containing at least 50 wt. % of ethylene oxide, based on the total weight of said polyether, (ii) sulfates, phosphates, alkylcarboxylates and fatty acid esters of the terminal hydroxy group of said polyethers, (iii) quaternary ammonium compounds of said polyethers that contain a nitrogen atom, with dialkylsulfates or alkyl halides, and (iv) salts of said polyethers with acetic acid or an alkylbenzene sulfonic acid,

or (II) a polymer of a cationic surfactant monomer having the formula



wherein R_1 is hydrogen or methyl; R_2 is a straight-chain or branched, alkyl or alkenyl having 8 to 24 carbon atoms or a substituted, straight-chain or branched, alkyl or alkenyl having 8 to 24 carbon atoms; R_3 and R_4 each is hydrogen, lower alkyl, C_2 to C_4 hydroxyalkyl or polyoxyalkylene ($\overline{P}$=1 to 3); Y is oxygen or —NH—; Z_1 is hydroxyalkylene having 2 to 4 carbon atoms and X is halogen or an acid residue, or a copolymer of said cationic surfactant monomer and at least one additional vinyl monomer, and the balance comprises water.

4,885,103

CROSS-LINKING TITANIUM & ZIRCONIUM CHELATES & THEIR USE

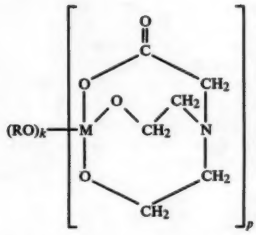
Donald E. Putzig, Newark, and Kenneth C. Smeltz, Wilmington, both of Del., assignors to E. I. DuPont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 31,921, Mar. 10, 1987, Pat. No. 4,808,739. This application Sep. 9, 1988, Ser. No. 242,113

Int. Cl.[4] E21B *43/26*

U.S. Cl. 252—8.551 **14 Claims**

1. In a process for selectively plugging permeable zones in subterranean formations or subterranean leaks wherein a crosslinked gel formed from a water solvatable polysaccharide is injected into the permeable zone or the site of the subterranean leak, the improvement comprising effecting crosslinking of the gel with a water-soluble N,N-bis(2-hydroxyethyl)glycine/-metal chelate represented by the formula:



wherein R is H or alkyl (1–2 C); M is Ti or Zr; k is a number in the range between 0 and 1, p is a number in the range between 1 and 2, and $k+p=2$.

4,885,104

METALWORKING LUBRICANTS DERIVED FROM NATURAL FATS AND OILS

Robert J. Sturwold, Cincinnati, Ohio, assignor to Cincinnati-Vulcan Company, Cincinnati, Ohio

Filed Sep. 2, 1988, Ser. No. 239,673

Int. Cl.[4] C10M *129/78*

U.S. Cl. 252—48.4 **28 Claims**

1. An improved metalworking lubricant having an acid value of 20 or less and hydroxyl value of 25 or less comprising the reaction product of:

(a) a natural fat or oil having an iodine value from 5 to 150, a saponification value from 170 to 265 and which is substantially free of hydroxy or keto functionality;

(b) 0.1 to 2 equivalents, per equivalent of the natural fat or

oil, of a hindered polyol having from 5 to 15 carbon atoms and 2 to 8 hydroxyl groups; and

(c) 0.1 to 2 equivalents, per equivalent of the natural fat or oil, of a dicarboxylic acid having from 2 to 36 carbon atoms or a lower alkyl ester thereof.

4,885,105

FILMS FROM PVA MODIFIED WITH NONHYDROLYZABLE ANIONIC COMONOMERS

Chihae Yang, Pleasanton, and Edward J. Kaufmann, San Ramon, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 50,260, May 14, 1987, Pat. No. 4,747,976. This application Mar. 31, 1988, Ser. No. 175,778

The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.

Int. Cl.[4] C11D *17/04*; C08F *20/04*; C08T *5/18*; C08L *29/04*

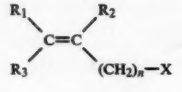
U.S. Cl. 252—90 **23 Claims**

1. A water-soluble polymeric film and cleaning composition combination comprising

(a) a water-soluble film about 1–5 mils thick, formed from a copolymer resin of vinyl alcohol having about 0–10 mole percent residual acetate groups and about 1–6 mole percent of a nonhydrolyzable anionic comonomer converted from the group of comonomers consisting of

(i) unsaturated acids such as acrylic, methacrylic, cis 2-butenoic, 3-butenoic, cinnamic, phenylcinnamic, pentenoic, methylene malonic, the alkali metal and ammonium salts thereof and the acyl halide derivatives thereof;

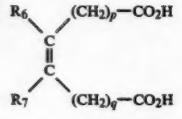
(ii) unsaturated esters, amides, and acyl halides of the following structure I:



I

wherein R_1, R_2 and R_3 are H, or alkyl, aryl or hydroxyalkyl groups, n is 0 or 1, and X is [$—CO_2R_4$,] —C(O)NR_4R_5 or —COY (wherein R_4 is H, alkyl, aryl, alkenyl, hydroxyalkyl, oxyalkyl or cyanoalkyl group, R_5 is H or an alkyl, aryl or hydroxyalkyl group, and Y is a halide); or X is CO_2R_4, wherein R_4 is an alkyl, aryl, alkenyl, hydroxyalkyl, oxyalkyl or cyanoalkyl group;

(iii) unsaturated diacids and their stereoisomers of the following structure II:



II

wherein p and q are integers from 0–5, R_6 and R_7 are H, or alkyl or aryl groups, and alkali metal and ammonium salts thereof;

(iv) anhydrides, acyclic and cyclic esters, amides and imides derived from structure II;

(v) unsaturated sulfonic acids and derivatives thereof; and

(vi) mixtures thereof, the resin being polymerized to an extent to result in a resin viscosity, when dissolved in 25° C. water to a level of about 4% of between about 4–35 cPs, the film including a plasticizing-effective amount of a plasticizer and;

(b) an alkaline or borate-containing cleaning composition, said composition being at least partially enclosed by the film wherein the film will dissolve when placed in an aqueous medium, freeing the cleaning composition.

4,885,106

STORABLE SEMICONDUCTOR CLEANING SOLUTION CONTAINING PERMONOSULPHURIC ACID

David J. Lapham, Widnes, and Geoffrey Hitchmough, Runcorn, both of United Kingdom, assignors to Micro-Image Technology Limited, London, United Kingdom

Filed Jan. 25, 1988, Ser. No. 147,782

Claims priority, application United Kingdom, Jan. 27, 1987, 8701759

Int. Cl.[4] C11D *7/18*

U.S. Cl. 252—100 **5 Claims**

1. A storable permonosulphuric acid-containing semiconductor cleaning solution, consisting essentially of; an initial solution of water;

from 30 percent to 76 percent by weight sulphuric acid; and from 1 percent to 20 percent by weight hydrogen peroxide; stabilized by a stabilizer combination consisting essentially of

(a) from 0.1 percent to 0.4 percent by weight of the solution of a organic pentavalent phosphorus-containing sequestrant; and

(b) 0.5 to 4 parts per million of a soluble tin compound, calculated as tin by weight of the initial hydrogen peroxide.

4,885,107

SHAMPOO COMPOSITIONS

Thomas A. Wetzel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 47,823, May 8, 1987, abandoned. This application Apr. 7, 1988, Ser. No. 178,715

Int. Cl.[4] C17D *3/60*

U.S. Cl. 252—106 **10 Claims**

1. A shelf stable shampoo composition consisting essentially of:

(a) from about 10% to about 25% of a synthetic surfactant;

(b) from about 0.5% to about 3.0% of ethylene glycol long chain (C_{16}–C_{22}) diesters having a stearate to palmitate ratio of about 10% to about 42% stearate to about 90% to about 58% palmitate and about 55% to about 80% stearate to about 45% to about 20% palmitate;

(c) from about 0.2% to about 2.5% of selenium sulfide;

(d) from about 1% to about 10% of an alkanol amide of fatty acid having from about 8 to about 14 carbon atoms; and

(e) the remainder water.

4,885,108

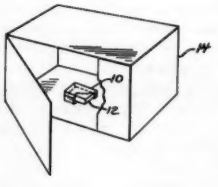
METHOD OF SHAPING OF SOAP BAR

Stephen P. Richter, Succasunna, N.J., assignor to colgate-Palmolive Company, Piscataway, N.J.

Continuation of Ser. No. 895,792, Aug. 12, 1986, abandoned, which is a continuation of Ser. No. 694,534, Jan. 24, 1985, abandoned. This application Feb. 25, 1988, Ser. No. 160,193

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—134 **20 Claims**



1. A method of shaping a soap bar comprising the steps of:

obtaining a soap bar;

placing the bar into a closed container;

subjecting the bar to microwaves with sufficient power and time to soften the bar; and

forming the softened bar into a desired shape and size.

4,885,109

QUICK-DRYING PACK-TYPE FACE-CLEANSING COMPOSITION

Isao Umemoto, Sakura; Fumiyo Shimada, Kashiwa, and Yuichiro Mitsuno, Sakura, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 164,916

Claims priority, application Japan, Mar. 18, 1987, 62-63235

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—174.21 **7 Claims**

1. A quick-drying pack-type face-cleansing composition comprising 1–50 wt. % of sebum-absorbing powder selected from the group consisting of bentonite, kaolin, talc, organobentonite, sericite, mica, silica, silicates, zeolite, diatomaceous earth, barium sulfate, calcium carbonate, polyvinyl chloride, polypropylene, polymethyl methacrylate, polymers of acrylic acid, nylon powder and polystyrene, 1–50 wt. % of water-repellant powder obtained by contacting the sebum-absorbing powder selected from the group consisting of bentonite, kaolin, talc, organobentonite, sericite, mica, silica, silicates, zeolite, diatomaceous earth, barium sulfate, calcium carbonate, polyvinyl chloride, polypropylene, polymethyl methacrylate, polymers of acrylic acid, nylon powder and polystyrene, with an effective amount of a silicone oil or a metal soap, 0.1–3 wt. % of a non-ionic surfactant having an HLB of 12–18, and 30–70 wt. % water.

4,885,110

BRANCHED POLYOXYALKYLENE COPOLYESTERS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE

Willibald Böse; Manfred Hofinger, both of Burgkirchen; Martin Hille, Liederbach; Roland Böhm, Kelkheim, and Friedrich Staiss, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 119,817

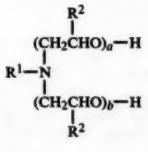
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638743

Int. Cl.[4] B01D *17/00, 19/04*

U.S. Cl. 252—341 **11 Claims**

1. A branched polyoxyalkylene copolyester, said copolyester having been prepared by esterifying an OH-containing component and a dicarboxylic component in the presence of a mineral acid or carboxylic acid esterification catalyst while removing the water of reaction, the esterification reaction being carried out in the melt at a temperature of 160° to 180° C., said OH-containing component consisting essentially of:

an oxyalkylated primary fatty amine of formula



(I)

in which R^1 is an alkyl radical or alkylene radical having 8 to 23 carbon atoms;

R^2 is H, in which case the polyoxyalkylene radicals of Formula I are polyoxyethylene, or R^2 is CH_3, in which case the polyoxyalkylene radicals of formula I are polyoxypropylene, or R^2 is both H and CH_3, in which case the polyoxyalkylene radicals of Formula I are the same or different and can carry blockwise-arranged units of ethylene oxide and propylene oxide; and a and b are identical or different and are integers or fractions with a total of 2 to 30, with the proviso that neither a nor b is zero; and

an alkoxylated polyhydric alkanol having 3 to 6 OH groups or an alkoxylated, at least trifunctional polyamine, which in each case contains 5 to 30 ethylene oxide units, 5 to 30 propylene oxide units, or 3 to 20 ethylene oxide units and 5 to 30 propylene oxide units per acid H atom, said dicarboxylic component consisting essentially of a dicarboxylic acid or a dianhydride thereof, said dicarboxylic acid being malonic, succinic, glutaric, adipic, pimelic, suberic, azelaic, sebacic, fumaric, maleic, or phthalic acid;

the oxyalkylated primary fatty amine, the alkoxylated polyhydric-alkanol or polyamine reactant, and the dicarboxylic component being employed in the molar ratio 1:0.01:0.5 to 1:1:3.

4,885,111

BRANCHED, QUATERNARY POLYOXYALKYLENE COPOLYESTERS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE

Willibald Böse; Manfred Hofinger, both of Burgkirchen; Martin Hille, Liederbach; Roland Böhm, Kelkheim, and Friedrich Staiss, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 119,823

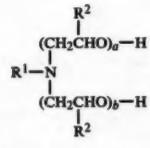
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638744

Int. Cl.[4] B01D *17/00, 19/04*

U.S. Cl. 252—344 **15 Claims**

1. A branched, quaternary polyoxyalkylene copolyester said copolyester having been prepared by esterifying an OH-containing component and a dicarboxylic component in the presence of a mineral acid or carboxylic acid esterification catalyst while removing the water of reaction, and then quaternization the thus-esterified product, the esterification reaction being carried out in the melt at a temperature of 160° to 180° C., and said quaternization being carried out in an aqueous phase at a temperature of 75° to 85° C., said OH-containing component consisting essentially of:

an oxyalkylated primary fatty amine of formula I



(I)

in which R^1 is an alkyl radical or alkylene radical having 8 to 23 carbon atoms;

R^2 to is H, in which case the polyoxyalkylene radicals of formula I are polyoxyethylene, or R^2 is CH_3, in which case the polyoxyalkylene radicals of formula I are polyoxypropylene, or R^2 is both H and CH_3, in which case the polyoxyalkylene radicals of Formula I are the same or different and can carry blockwise-arranged units of ethylene oxide and propylene oxide; and

a and b are identical or different and are integers or fractions with a total of 2 to 30, with the proviso that neither a nor b is zero; and

an alkyoxylated polyhydric alkanol having 3 to 6 OH groups or an alkoxylated, at least trifunctional polyamine, which in each case contains 5 to 30 ethylene oxide units, 5 to 30 propylene oxide units, or 3 to 20 ethylene oxide units and 5 to 30 propylene oxide units per acid H atom,

said dicarboxylic component consisting essentially of a dicarboxylic acid or a dianhydride thereof, said dicarboxylic acid being malonic, succinic, glutaric, adipic, pimelic, suberic, azelaic, sebacic, fumaric, maleic, or phtalic acid;

the oxyalkylated primary fatty amine, the alkyoxylated polyhydric-alkanol or polyamine reactant, and the dicarboxylic component being employed in the molar ratio 1:0.01:0.5 to 1:1:3; the thus-esterfied product being quarternized by reaction with 1 to 6 moles of ethylene oxide or propylene oxide per mole of nitrogen-containing monomer units in the said esterified product, in the presence of an equimolar amount, relative to the nitrogen-containing monomer units in said esterified product, of a mineral acid or a C_1–C_6 carboxylic acid.

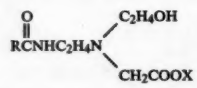
4,885,112
SURFACE ACTIVE SECONDARY AMIDOAMINO ACID OR SALT COMPOUNDS

Kohshiro Sotoya, Wakayama; Makoto Kubo, Wakayama; Kazuhiko Okabe, Wakayama; Masanobu Tanigaki, Wakayama; Masaji Yamanishi, Wakayama, and Hajime Hirota, Tokyo, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Nov. 10, 1987, Ser. No. 118,887
Claims priority, application Japan, Nov. 18, 1986, 61-274928
Int. Cl.[4] C07C *50/22, 101/72*
U.S. Cl. 252—352 **10 Claims**

1. A surface active agent comprising:

(A) a secondary amidoamino acid or a salt thereof having the formula (I):



(I)

wherein R is an alkyl group, hydroxyalkyl group, aralkyl group or alkenyl group having from 7 to 23 carbon atoms and X is a hydrogen atom, ammonium ion or triethanolammonium ion, and wherein said surface active agent contains

(B) not more than 0.2 moles of an inorganic salt per 100 grams of said secondary amidoamino acid or per 100 grams of said secondary amidoamino acid salt, wherein the content of inorganic salt in moles per 100 grams of said secondary amidoamino acid salt is calculated according to the following equation:

$$\text{moles of inorganic salt per 100 grams secondary amidoamino acid salt} = \frac{\text{moles inorganic salt in surface active agent}}{\text{grams of secondary amidoamino acid salt in surface active agent} \times \frac{\text{mol wt. of secondary amidoamino acid salt}}{\text{mol wt. of secondary amidoamino acid}}} \times 100.$$

4,885,113
NONLINEAR OPTICALLY RESPONSIVE INORGANIC-ORGANIC COMPOSITE COMPOSITIONS

Gunilla E. Gillberg-LaForce, Summit; Thomas M. Leslie, Clinton Township, Hunterdon County; Tessie M. Che, Westfield, and Marie Borzo, Basking Ridge, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Aug. 20, 1987, Ser. No. 87,493
Int. Cl.[4] G02F *1/35*
U.S. Cl. 252—582 **21 Claims**

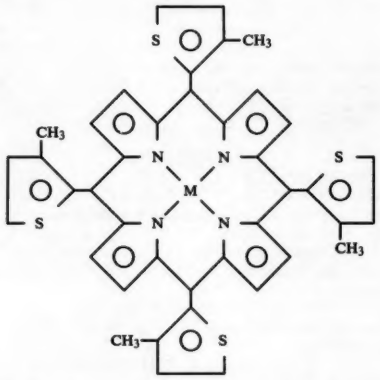
1. A nonlinear optical medium consisting of a composite composition of a homogeneous inorganic glass monolith with a microporous structure containing an incorporated solution which comprises a solvent component and an organic component having a molecular weight less than about 1000 and exhibiting nonlinear optical response, and wherein the glass monolith has sealed outer surfaces, and the glass monolith microporous structure has pore diameters in the range between about 15–2000 angstroms, and all of the pore diameters are within about a 100 angstrom diameter variation range.

4,885,114
METALLIZED TETRA((MESO)-5-METHYL-2-THIOPHENE)PORPHINES, PLATINUM (5-BROMO OCTAETHYLPORPHINE) AND OPTICAL FILTERS CONTAINING SAME

Bruce S. Gordon, Shelton, and Alan Adler, West Redding, both of Conn., assignors to Barnes Engineering Co., Shelton, Conn.

Continuation-in-part of Ser. No. 41,211, Apr. 22, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 254,377
Int. Cl.[4] F21V *9/06*
U.S. Cl. 252—589 **38 Claims**

1. A metallized tetra ((meso)-5-methyl-2-thiophene) porphine of the formula:



and the corresponding rotational isomers thereof wherein M is metal selected from the group consisting of nickel, palladium, rhodium, platinum, copper, silver, magnesium, indium, zinc, cobalt and iron.

4,885,115
LIQUID ELECTROLYTE FOR USE IN ELECTROLYTIC CAPACITOR

Yutaka Yokoyama, and Fumihiko Shinozaki, both of Tokyo, Japan, assignors to Nippon Chemi-Con Corporation, Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 168,103
Claims priority, application Japan, Mar. 12, 1987, 62-57498
Int. Cl.[4] H01G *9/00*
U.S. Cl. 252—62.2 **2 Claims**

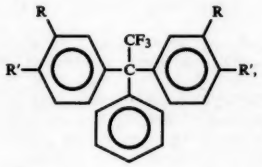
1. A liquid electrolyte for use in an electrolytic capacitor which uses a mixture of γ-butyrolactone and acetonitrile as a solvent system, said mixed solvent containing as a solute at least one member selected from among monocarboxylic and dicarboxylic acid salts of tetraalkylammonium.

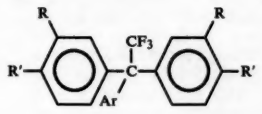
4,885,116
SUBSTITUTED 1,1,1-TRIARYL-2,2,2-TRIFLUOROETHANES AND PROCESSES FOR THEIR SYNTHESIS

William B. Alston, Medina, Ohio, and Roy F. Gratz, Fredericksburg, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

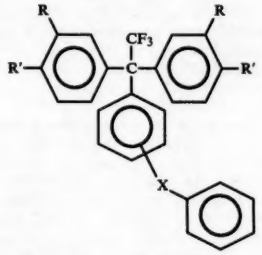
Division of Ser. No. 924,474, Oct. 29, 1986, Pat. No. 4,758,380. This application Feb. 23, 1988, Ser. No. 159,071
Int. Cl.[4] C07C 15/16; C09B 11/04
U.S. Cl. 562—413 2 Claims

1. A process for preparing a 1,1-bis(dicarboxyaryl)-1-aryl-2,2,2-trifluoroethane compound which comprises oxidation of a 1,1-bis(dialkylaryl)-1-aryl-2,2,2-trifluoroethane compound wherein the 1,1-bis(dialkylaryl)-1-aryl-2,2,2-trifluoroethane is selected from formulae:





or



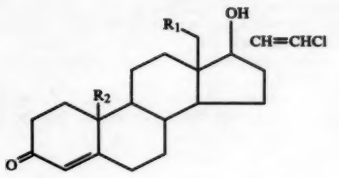
wherein Ar is selected from phenyl, naphthalene, phenanthrene, or pyrene, and X is O, S, SO_2, NH, PH, Nϕ, Pϕ, C=O, CH_2 or CHϕ and R and R′ are the same or different and are individually an alkyl radical, the oxidation being carried out in the prsence of vanadium pentoxide wherein the oxidation is conducted in vapor phase oxidations or air/liquid phase cobalt acetate/acetic acid oxidation technology.

4,885,117
PROCESS FOR THE PREPARATION OF (Z)-17α-HALOVINYL STEROIDS

Helmut Hofmeister; Henry Laurent, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Aug. 11, 1987, Ser. No. 84,042
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1986, 3627154
Int. Cl.[4] C07J 1/00
U.S. Cl. 260—397.45 4 Claims

1. A (Z)-17α-chlorovinyl steroid of the formula



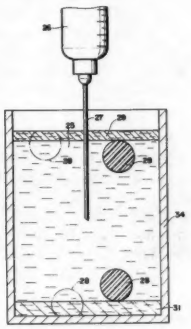
wherein

. . . . symbolizes a single bond or a double bond and R_1 and R_2 independently represent H or methyl.

4,885,118
PROCESS FOR MANUFACTURING SPHERICAL OBJECTS

Toshio Nagase, Ibaragi, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1988, Ser. No. 261,305
Claims priority, application Japan, Oct. 23, 1987, 62-268707
Int. Cl.[4] B29B 9/00; B29C 35/04
U.S. Cl. 264—13 7 Claims



1. A process for manufacturing spherical objects comprising ejecting into a reaction medium layer a predetermined amount of liquid material which forms spherical objects and allowing the spherical objects to react and set while floating in said reaction medium layer, said reaction medium layer being restricted by a first blocking and protective liquid layer having a smaller specific gravity than that of said reaction medium layer and being located above said reaction medium layer and a second blocking and protective liquid layer having a gravity specific gravity than that of said reaction medium layer and being located below said reaction medium layer.

4,885,119
METHOD OF MAKING A MULTILAYER FILM

Walter B. Mueller, Inman, and Henry G. Schirmer, Spartanburg, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 98,116, Sep. 17, 1987, Pat. No. 4,816,343, which is a division of Ser. No. 900,576, Aug. 26, 1986, Pat. No. 4,726,997. This application Oct. 21, 1988, Ser. No. 261,297
Int. Cl.[4] B29C 35/08, 47/00
U.S. Cl. 264—22 14 Claims

1. A method of making a multilayer film suitable for packaging medical solutions comprising:

(a) blending an ethylene copolymer with a carbonate of an alkali metal; and

(b) coextruding a core layer of a polymeric material which imparts flexibility to the film, a sealant layer, an outer

layer of a flexible polymeric material, and first and second intermediate adhesive layers;

wherein said first adhesive layer bonds the core layer to the sealant layer; and

wherein said second adhesive layer bonds the core layer to the outer layer;

said adhesive layers comprising ethylene copolymer, and at least one of the adhesive layers comprising the blend of (a).

4,885,120

PREPARATION OF METAL OXIDE FIBERS FROM INTERCALATED GRAPHITE FIBERS

Barry W. McQuillan, San Diego, and George H. Reynolds, San Marcos, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 5, 1988, Ser. No. 217,991

Int. Cl.[4] D01F *11/10*

U.S. Cl. 264—60 **2 Claims**

1. A method for making a composite aluminum oxide-zirconinum oxide fiber, comprising the steps of:

(a) providing a graphite fiber;

(b) intercalating a mixture of $AlCl_3$, $ZrCl_4$ and Cl_2 into the graphite fiber to make $C_3^{+}{}_6{}^{+}\cdot AlCl_4^{-}\cdot ZrCl_5^{-}$ by heating the mixture to 250° C. for 4 days until all the metal chloride is intercalated into the graphite fiber; and,

(c) heating the intercalated graphite fiber in air at 800° C. to oxidize the carbon and leave a composite aluminum oxide-zirconium oxide fiber.

4,885,121

METHOD OF MAKING A DUAL DUROMETER SELF-LOCKING AND SEALING PLUG

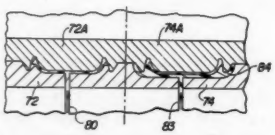
Praful J. Patel, Livonia, Mich., assignor to Chemcast Corporation, Madison Heights, Mich.

Division of Ser. No. 80,850, Aug. 3, 1987, Pat. No. 4,784,285.

This application Jun. 22, 1988, Ser. No. 209,814

Int. Cl.[4] B29C *45/16*; B32B *27/08*

U.S. Cl. 264—255 **4 Claims**



1. A continuous method for making a self-locking and sealing plug for filling and sealing an opening in a panel comprising:

(1) providing progressive injection molding means having a pair of injection units,

(2) providing in the first of said units a molten thermoplastic resin-based polyolefin material having a durometer hardness reading at ambient temperature of about 60 to about 110 Rockwell R,

(3) providing in the second of said units a molten thermoplastic electomeric material consisting of a blend of thermoplastic crystalline polyolefin resin and cured monoolefin copolymer rubber and having a durometer reading at ambient temperature of about 65 Shore A to about 50 Shore D,

(4) providing first and second mold means having multi-cavities respectively and relatively movable between open positions and two alternate closed molding positions,

(5) configuring said cavities of said first mold means and at least one of said cavities of said second mold means to cooperate and provide a first complete mold cavity when said mold means are at either of said closed molding positions to form an opening-filling portion of said plug upon injection of said molten thermoplastic material from said first injection unit into said first complete mold cavity,

(6) configuring at least one other of said cavities of said second mold means to cooperate with said cavities of said first mold means and provide a second complete mold cavity shaped when said mold means are at either of said closed molding positions and a hardened opening-filling portion of said plug is within the cooperating cavity of said first mold means to form a sealing portion of said plug having portions in intimate contact with portions of said opening-filling portion upon injection of said molten thermoplastic material from said second injection unit into said second complete mold cavity,

(7) heating said thermoplastic material in said first unit to a temperature within a range of about 380° F. to 390° F., and heating said thermoplastic material in said second unit to a temperature within a range of about 375° F. to 390° F.,

(8) moving said mold means to one of said closed molding positions,

(9) injecting thermoplastic material from said first unit into said first complete mold cavity to form an opening-filling portion,

(10) cooling said first complete mold cavity,

(11) moving said mold means to their open positions,

(12) while retaining the opening-filling portion within the cavity of said first mold means, simultaneously moving said mold means and said opening-filling portion within the last named cavity to the other of said closed molding positions,

(13) simultaneously injecting said heated thermoplastic materials from said first and second units into said first and second complete mold cavities respectively to form an opening-filling portion and a molded part in said first and second complete mold cavities respectively,

(14) cooling said mold means to partially harden said thermoplastic materials therein and to cool said opening-filling portion in said first complete mold cavity to a temperature within a range of about 325° F. to about 335° F.;

(15) moving said mold means to their open positions,

(16) ejecting the partially hardened part formed in said second complete mold cavity,

(17) while retaining the partially hardened opening-filling portion within the cavity of said first mold means that cooperated to form said opening-filling portion, simultaneously moving said mold means and said opening-filling portion at said cooled temperature within the last named cavity to the other of said closed molding positions,

(18) repeating steps (13)–(17), thereby in accordance with injection of said molten materials into said first and second complete mold cavities per step 13, to units and bond said opening-filling portion with a sealing portion of said plug formed in said second complete mold cavity and simultaneously to form another opening-filling portion of said plug in said first complete mold cavity.

4,885,122

INSTRUMENTATION PORT CLAMPS

Cecil R. Stapleton, Pensacola, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 925,863, Oct. 30, 1986, abandoned.

This application Sep. 2, 1988, Ser. No. 241,820

Int. Cl.[4] G21C *13/00*

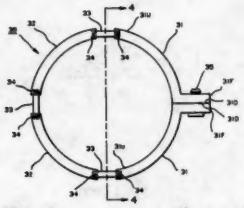
U.S. Cl. 376—203 **8 Claims**

5. A method for sealing the interface between a first generally tubular conduit and a second generally tubular conduit, said tubular conduits being a portion of a nuclear reactor vessel instrument port, the outer surface of the interfacing ends of said conduits being adapted to receive a clamp, said method comprising:

(a) providing a clamp comprising two end body members, each of said end body members having: an inner surface adapted to engage at least a portion of said clamp receiv-

ing portion of said tubular conduit; a first end; and a second end, and means for linking said first ends such that the spacing between said second ends is adjustable, said second ends each having a datum surface thereon;

(b) opening said clamp by separating said second ends by a distance greater than about the diameter of said tubular bodies;



(c) placing said clamp in operative association with said clamp receiving portions by passing the open end of said clamp around said tubular bodies; and

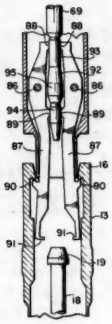
(d) sealing the interface between said tubular bodies by ensuring intimate contact between said datum surfaces whereby said intimate contact between said datum surfaces produces the proper axial pressure on said clamp receiving portions and prevents oven compression at said interface.

4,885,123

APPARATUS FOR HANDLING CONSTITUENT ELEMENTS OF REACTOR CORE

Hisaaki Ikeuchi; Manabu Madokoro; Haruo Sato, and Takashi Jodoi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 152,989
Claims priority, application Japan, Feb. 13, 1987, 62-29504
Int. Cl.[4] G21C *7/00, 19/00*
U.S. Cl. 376—233 **5 Claims**



1. In a nuclear reactor having a core composed of core constituent elements, the core constituent elements including a plurality of fuel rod assemblies and a plurality of control rod assemblies, each of the control rod assemblies having a control rod provided for vertical movement, an apparatus for handling the core constituent elements comprising:

a gripper supporting frame;

a plurality of grippers pivotally mounted within a lower portion of the gripper supporting frame for pivotal movement about respective pivot points and being equally angularly spaced from one another about an axis of the gripper supporting frame, each of the grippers being an elongated member having means forming a lower hook at a lower portion of the gripper disposed below the pivot point thereof and projecting inwardly, each of the grippers having means forming an upper hook disposed below the pivot point thereof and above the lower hook means and projecting outwardly, each of the grippers having an upper projection projecting inwardly provided above the pivot point thereof and at an upper portion of the gripper and a lower projection projecting inwardly provided below the pivot point thereof, the lower hook means being arranged for engagement with an outside of a head portion of the control rod of the control rod assemblies when the plurality of gripper are in a closed position so as to enable vertical movement of the control rod during engagement, and the upper hook means being arranged for engagement with an inside of a handling head of at least one of a fuel rod assembly and a control rod assembly of the core constituent elements when the grippers are in an open position for enabling vertical movement of the core constituent element during engagement when the grippers are in the open position;

an operational shaft extending vertically and between the plurality of grippers, the operational shaft having a small diameter portion provided at a lower end part thereof and a large diameter portion provided above the small diameter portion, the small diameter portion being engageable with the lower projections of the grippers when the operational shaft is lowered to thereby open the grippers to enable the upper hook means of the grippers to engage with the inside of the handling head and the large diameter portion being engageable with the upper projections of the grippers when the operational shaft is raised to thereby close the grippers and enable the lower hook means to engage an outside of the head portion of the control rod;

means, provided at an upper end portion of the operational shaft, for raising and lowering the operational shaft; and

means, provided at an upper portion of the handling apparatus, for raising and lowering the grippers, the operational shaft and the operational shaft raising and lowering means as a whole;

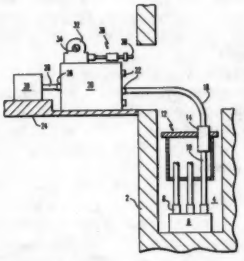
whereby the apparatus for handling the core constituent elements enable rasing and lowering of control rod assemblies and fuel assemblies as well as a control rod of the control rod assemblies.

4,885,124

REMOVAL OF OBSTRUCTIONS IN THIMBLES OF NUCLEAR POWER REACTORS

Haydn C. Doughty, Bourbonnais, Ill., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1988, Ser. No. 277,830
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—260 **5 Claims**



1. In a power reactor having a pressure vessel containing a core and a plurality of thimbles extending into the core to

provide passages for a flux detector, a movable support member located outside of the pressure vessel and carrying a plurality of tubular members each detachably connected to a respective thimble, and transfer means removably coupled to the tubular members for introducing a flux detector into a selected thimble via a respective tubular member, the improvement comprising:

an obstruction removal device; and

drive means carrying said obstruction removal device and selectively couplable to said tubular members, when those members are decoupled from said transfer means, for introducing said obstruction removal device into the respective tubular member and advancing said obstruction removal device through the respective tubular member and into the selected thimble to the location of the obstruction.

4,885,125

METHOD FOR IN-MOLD POLYMERIZATION OF UNSATURATED COMPOUND

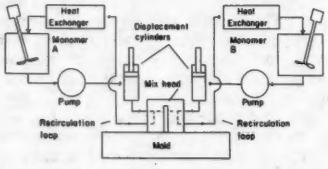
Yasuyuki Kato; Masahiro Yuyama; Masahiko Moritani, all of Ehime, and Yukio Yasunori, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 27, 1986, Ser. No. 900,974

Claims priority, application Japan, Aug. 28, 1985, 60-190598

Int. Cl.[4] B29C *39/42, 39/44*

U.S. Cl. 264—328.6 **19 Claims**



1. A method for in-mold polymerization of an unsaturated compound having a vinyl or vinylidene group comprising:

continuously mixing one portion of an unsaturated monomer compound containing a polymerization initiator and another portion of an unsaturated monomer compound containing a polymerization accelerator;

continuously pouring the mixed monomer portions into a mold cavity; and

polymerizing the monomer portion for not longer than 10 minutes.

4,885,126

INTERCONNECTION MECHANISMS FOR ELECTRONIC COMPONENTS

John D. Polonio, 20965 SW. Blaine Ter., Beaverton, Oreg. 97006

Continuation-in-part of Ser. No. 920,582, Oct. 17, 1986, abandoned. This application Mar. 18, 1988, Ser. No. 170,444

Int. Cl.[4] H05K *1/18*

U.S. Cl. 361—399 **19 Claims**

1. In combination with a mounting device for containing an electronic circuit component, said mounting device having a plurality of contacts electrically connected to respective electrical conductors of an electrical circuit and having a plurality of sides each including a face portion, an electrical probe assembly, comprising:

(a) a plurality of probe sections each adapted to fit on a respective side of said mounting device for containing an electronic circuit component and each of said probe sections having an internal face configuration adapted to fit matingly against a respective face portion of said mounting device;

(b) a plurality of physically compliant electrical contacts contained in at least one of said sections of said probe and located, respectively, in predetermined positions with respect to the respective face portion of said mounting device against which each such one of said probe sections is adapted to fit; and

(c) tensionable means associated with said probe for holding said probe in a predetermined position with respect to said mounting device.

4,885,127

NUCLEAR FUEL ROD SUPPORT GRID WITH ATTACHABLE SPRING AND DIMPLE SUPPORT SPACERS

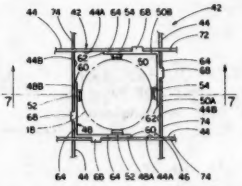
Bungo Yokoyama, Tokaimura, Japan, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1988, Ser. No. 186,274

Claims priority, application Japan, Apr. 30, 1987, 62-107283

Int. Cl.[4] G21C *3/34*

U.S. Cl. 376—462 **23 Claims**



7. A nuclear fuel rod support grid, comprising:

(a) a plurality of straps being interleaved with one another to form a matrix of hollow cells, each cell for receiving one fuel rod and being defined by intersecting pairs of opposing wall portions of said straps which wall portions are shared with adjacent cells;

(b) a plurality of fuel rod clamping springs and dimples being associated with said wall portions of said straps defining each cell and protruding into said cell so as to clamp a fuel rod therebetween; and

(c) a pair of spacers inserted in each said cell along said strap walls portions defining each said cell, one of said spacers supporting said springs and the other of said spacers supporting said dimples, said spacers being separate from and detachably mounted on said wall portions of said straps defining each said cell;

(d) each said spacer being L-shaped in cross section and made from a metal plate that is bent into a ninety-degree configuration to form a pair of parts disposed generally perpendicular to each other and integrally connected together at their inner edges, each part having a height approximately identical to the height of each of said strap wall portions defining each said cell;

(e) one of said spacers being lodged in one corner of each said cell formed by one intersecting pair of said strap wall portions with said pair of parts of said one spacer extending along said wall portions forming said one corner;

(f) the other of said spacers being lodged in a diagonal opposite corner of each said cell formed by the other intersecting pair of said strap wall portions with said pair of parts of said other spacer extending along said wall portions forming said diagonal opposite corner.

4,885,128
METHOD FOR IMPROVING PERFORMANCE OF IRRADIATED STRUCTURAL MATERIALS

Janez Megusar, Belmont; Otto K. Harling, Hingham, and Nicholas J. Grant, Winchester, all of Mass., assignors to Janez Megusar, Belmont, Mass.

Filed Jul. 30, 1985, Ser. No. 760,632
Int. Cl.[4] G21C *1/01, 19/03, 16/00;* G21B *1/00*
U.S. Cl. 376—463 18 Claims

1. A process for reducing radiation damage of nuclear reactor components comprising:

(a) selecting an alloy of a strong, ductile, crystalline material obtained by devitrification of a metallic glass;

wherein the amorphization temperature of said metallic glass alloy is less than the melting temperature of the alloy, and greater than the lower limit of the operating temperature of the nuclear reactor;

wherein said alloy does not undergo thermal neutron reactions; and

wherein said alloy has low activation;

(b) processing said alloy to form components for use in a nuclear reactor;

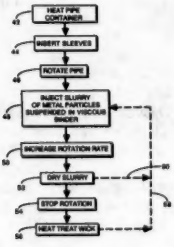
(c) installing the components in a nuclear reactor;

(d) operating the nuclear reactor at a temperature slightly above the amorphization temperature of said alloy.

4,885,129
METHOD OF MANUFACTURING HEAT PIPE WICKS

John F. Leonard, and Jerry E. Beam, both of Beavercreek, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 24, 1988, Ser. No. 261,809
Int. Cl.[4] B22F *5/00*
U.S. Cl. 419—2 10 Claims



1. A method for making a heat pipe wick on an inside surface of a heat pipe container, comprising the steps of:

(a) providing a slurry of metal particles suspended in a viscous binder;

(b) coating at least part of the inside surface of the container with the slurry;

(c) rotating the container so that the slurry generally covers the inside surface of the container;

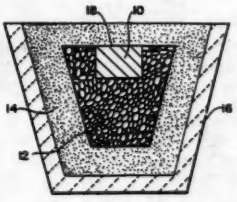
(d) while continuing to rotate the container, drying the slurry to form a green wick; and,

(e) heat treating the green wick to yield a final composition of the heat pipe wick.

4,885,130
PROCESS FOR PREPARING SELF-SUPPORTING BODIES AND PRODUCTS PRODUCED THEREBY

Terry D. Claar, Newark, Del.; Steven M. Mason, Norwood, Pa.; Kevin P. Pochopien, Newark, Del.; Danny R. White, Elkton, Md., and William B. Johnson, Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 137,044, Dec. 23, 1987, which is a continuation-in-part of Ser. No. 73,533, Jul. 15, 1987. This application Jan. 13, 1989, Ser. No. 296,771
Int. Cl.[4] B22T *1/00*
U.S. Cl. 419—12 4 Claims



1. A method for producing a self-supporting body, comprising:

selecting a parent metal;

heating said parent metal in a substantially inert atmosphere to a temperature above its melting point to form a body of molten parent metal;

contacting said body of molten parent metal with a permeable mass comprising boron carbide and at least one donor material selected from the group consisting of a boron donor material and a carbon donor material;

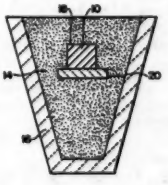
maintaining said temperature for a time sufficient to permit infiltration of molten parent metal into said permeable mass and to permit reaction of said molten parent metal with said boron carbide to form at least one boron-containing compound and to permit reaction of said molten parent metal with said at least one donor material; and

continuing said infiltration and reaction for a time sufficient to produce said self-supporting body comprising at least one parent metal boron-containing compound.

4,885,131
PROCESS FOR PREPARING SELF-SUPPORTING BODIES AND PRODUCTS PRODUCED THEREBY

Marc S. Newkirk, Newark, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Filed Jan. 13, 1989, Ser. No. 296,773
Int. Cl.[4] B22F *1/00*
U.S. Cl. 919—12 8 Claims



1. A method for producing a self-supporting body, comprising:

selecting a parent metal;

heating said parent metal in a substantially inert atmosphere to a temperature above its melting point to form a body of molten parent metal;

contacting said body of molten parent metal with a permea-

ble mass comprising of a boron donor material and a carbon donor material;

maintaining said temperature for a time sufficient to permit infiltration of molten parent metal into said permeable mass and to permit reaction of said molten parent metal with each of said boron donor material and said carbon donor material to form at least one boron-containing compound and at least one carbon-containing compound; and

continuing said infiltration and reaction for a time sufficient to produce said self-supporting body comprising at least one parent metal boron-containing compound.

4,885,132

CEMENTED CARBONITRIDE ALLOY WITH IMPROVED PLASTIC DEFORMATION RESISTANCE

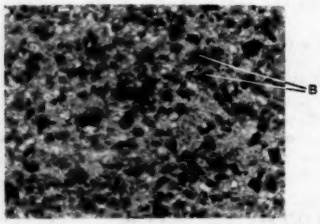
Nils G. L. Brandt, Skogsvägen 3, and Ake B. Byhlin, Ervallakroken 11, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Division of Ser. No. 121,797, Nov. 17, 1987. This application May 3, 1989, Ser. No. 346,706

Claims priority, application Sweden, Nov. 20, 1986, 8604971; Dec. 22, 1986, 8605519

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—15 **2 Claims**



1. Method of producing a sintered alloy comprising carbides and nitrides of Ti, Ta and/or Nb characterized in that a mixture of powders of TiC and (Ta,Nb)C and/or TaC is heated under such conditions that the resultant product contains a solid solution of (Ti,Ta)C or (Ti,Ta,Nb)C, crushing said product to a powder, mixing said powder with carbides and/or nitrides of metals selected from groups IV, V and VI and one or more of Co, Ni and Fe as binder in powder form, pressing and sintering.

4,885,133

WEAR-RESISTANT SINTERED IRON-BASED ALLOY AND PROCESS FOR PRODUCING THE SAME

Satoshi Fujii, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 3,342, Jan. 14, 1987, Pat. No. 4,840,665. This application Apr. 6, 1989, Ser. No. 333,672

Int. Cl.[4] C21D *1/00*

U.S. Cl. 419—29 **4 Claims**

1. A process for producing a wear-resistant sintered iron-based alloy comprising the steps of

mixing a powder mixture comprising (1) from 10 to 80 wt % based on the total amount of said powder mixture of an alloy powder comprising from 10 to 20 wt % of Cr and the balance of Fe, based on said alloy powder; (2) from 1.0 to 2.5 wt % based on the total amount of said powder mixture of carbon powder; and (3) the balance based on the total amount of said powder mixture of alloy powder or mixed powder comprising from 0.5 to 3.0 wt % of Cr, from 0.4 to 1.0 wt % of Mn, from 0.1 to 0.4 wt % of Mo, and the balance of Fe, based on the total amount of said alloy powder or mixed powder;

compressing and molding said powder mixture thus obtained;

sintering the molded mixture at a temperature of from 1,100° to 1,250° C. under vacuum or under an inert gas atmosphere;

cooling to room temperature;

heating again to a temperature of from 82° to 950° C. the sintered product;

quenching; and

tempering the same.

4,885,134

SPUTTERING TARGET AND METHOD OF PREPARING THE SAME

Tukaram K. Hatwar, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1988, Ser. No. 234,996

Int. Cl.[4] G11B *7/24*; B21C *37/00*

U.S. Cl. 420—416 **8 Claims**

1. A sputtering target comprising a fine grain, physically sound, uniform composition, uniform structure corrosion resistant alloy of terbium, iron and cobalt and containing from about 2.5 to about 15 atomic percent of an element selected from the group consisting of platinum, chromium, nickel, palladium, tantalum and hafnium.

4,885,135

FINE GOLD ALLOY WIRE FOR BONDING OF A SEMI-CONDUCTOR DEVICE

Naoyuki Hosoda; Masayuki Tanaka, both of Osaka, and Tamotsu Mori, Toyonaka, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 825,942, Feb. 3, 1986, which is a continuation of Ser. No. 586,642, Mar. 7, 1984, abandoned, which is a continuation-in-part of Ser. No. 419,840, Sep. 20, 1982, abandoned. This application Jan. 9, 1989, Ser. No. 296,350

Claims priority, application Japan, Dec. 4, 1981, 195299; Mar. 10, 1982, 37580

Int. Cl.[4] C22C *5/02*

U.S. Cl. 420—507 **4 Claims**

3. A fine gold alloy wire for use in the bonding of semiconductor elements characterized by having high tensile strength and consisting essentially of 0.0003 to less than 0.0010 wt% of at least one rare earth element selected from the group consisting of La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Sc and Y, and 0.0001 to 0.0060 wt% of of at least one element selected from the group consisting of Ge, Be and Ca, with the balance being Au and incidental impurities.

4,885,136

METHOD OF ANTICORROSIVE TREATMENT FOR SOFT WATER BOILERS

Sakae Katayama, Osaka; Hirohiko Katayama; Toshihiko Mukai, both of Nishinomiya, and Yoshinari Kawasaki, Osaka, all of Japan, assignors to Katayama Chemical Works Co., Ltd., Osaka, Japan

Filed Oct. 15, 1987, Ser. No. 108,764

Claims priority, application Japan, Oct. 17, 1986, 61-248075

Int. Cl.[4] C23F *11/10*

U.S. Cl. 422—15 **8 Claims**

1. A method of anticorrosive treatment for soft water boilers which comprises adding to a boiler water system which uses soft water at a temperature of at least 150° C.: (a) at least one phosphorous compound selected from the group consisting of polyphosphoric acids, orthophosphoric acids and organophosphoric acids, in an amount of 10–200 mg/l, (b) at least one carboxylic acid compound selected from the group consisting of aliphatic hydroxycarboxylic acids and amino acids, in an amount of 40–500 mg/l, and (c) at least one metal compound that releases in water metal ions selected from the group consisting of tin ions, manganese ions and nickel ions, in an amount of 0.5–50 mg/l as metal ion, wherein the weight ratio of the compound (b) to the metal ions of the compound (c) is 3 or

more, thereby preventing corrosion of iron family metals in the boiler water system.

4,885,137

ZERO GRAVITY FLUIDIZED BED OPERATION

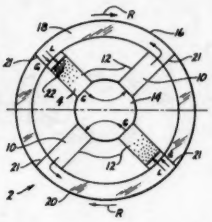
Wolfram Lork, Daisendorf, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 176,838

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711177

Int. Cl.[4] B01J 8/18

U.S. Cl. 422—140 4 Claims



1. Apparatus for the generation of whirling flow and a fluidized bed under zero gravity conditions, comprising:

a wheel-like configuration having a plurality of radially disposed spokes and means mounting said configuration for rotation about a central axis thereof;

at least one reaction chamber for solid particles and being mounted in relation to and arranged in one of the spokes of the wheel-like configuration and thus being a part of a centrifuge, the chamber thus extending in a radial direction;

means for feeding gas into each chamber in a radially inward direction for fluidizing the particles against any centrifugal force on accord of rotational movement of the wheel-like configuration;

means for causing liquid droplets to be fed into each chamber;

means for extracting gas plus vaporized liquid from each chamber at the radially innermost point of that chamber; and

means for circulating the gas back to the means for feeding and including means for separating vapor from the gas prior to feeding it back to each reactor chamber through the means for feeding.

4,885,138

DUAL FUNCTION HEAT WITHDRAWAL APPARATUS

David A. Lomas, Arlington Heights, Ill., assignor to UOP, Des Plaines, Ill.

Division of Ser. No. 18,265, Feb. 24, 1987, Pat. No. 4,757,039. This application Aug. 26, 1987, Ser. No. 89,708

Int. Cl.[4] F27B 15/16

U.S. Cl. 422—144 5 Claims

1. Apparatus for regenerating a coke contaminated, fluid catalyst which apparatus comprises in combination:

(a) a vertically oriented combustion chamber;

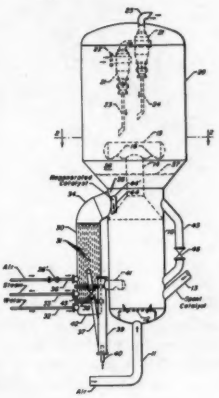
(b) a disengagement chamber located superadjacent to and above said combustion chamber and in communication therewith;

(c) a catalyst collection section at the bottom of said disengagement chamber;

(d) a catalyst cooler comprising a shell and tube heat exchanger of vertical orientation, remote from said combustion and disengagement chamber, having a catalyst inlet at an upper portion of the shell side of said heat exchanger and a catalyst outlet at a bottom portion of the shell side of said heat exchanger;

(e) a catalyst cooler conduit connecting said catalyst collection section with said heat exchanger inlet, such that regenerated catalyst from said disengagement chamber can circulate to said catalyst cooler, said cooler conduit having an inlet in said collection space located within a 120° semi-circular sector of said disengagement chamber;

(f) a cooled-catalyst conduit connecting said catalyst outlet of said heat exchanger with said combustion chamber,



such that cooled catalyst can flow from said heat exchanger to said combustion chamber;

(g) means for adding a variable amount of fluidizing gas to said catalyst cooler and maintaining a fluidized catalyst bed therein;

(h) means for regulating catalyst flow through said cooled catalyst conduit; and

(i) a regenerated catalyst conduit for withdrawing regenerated catalyst from the disengagement chamber said regenerated catalyst conduit having an inlet located in said collection space within said 120° semi-circular sector.

4,885,139

COMBINED ELECTROSTATIC PRECIPITATOR AND ACIDIC GAS REMOVAL SYSTEM

Leslie E. Sparks, Durham, and Norman Plaks, Raleigh, both of N.C., assignors to The United States of America as represented by the Administrator of U.S. Environmental Protection Agency, Washington, D.C.

Continuation-in-part of Ser. No. 768,265, Aug. 22, 1985, abandoned. This application May 8, 1987, Ser. No. 47,577

Int. Cl.[4] B03C 3/04, 3/40

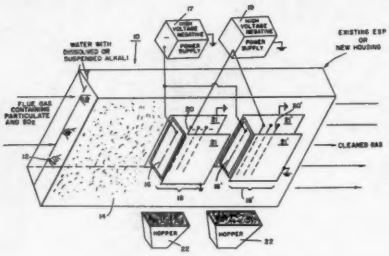
U.S. Cl. 422—169 4 Claims

1. A method of retrofitting an apparatus for removing acidic gas and particulate matter from air, the device to be retrofit including an electrostatic precipitator, lacking a precharger, positioned within a housing, a flue gas generating means outside said housing, an entry port in said housing and upstream of said electrostatic precipitator; an exit port in said housing and downstream of said electrostatic precipitator; and ductwork, outside said housing, leading from said generating means to said entry port; said retrofitting comprising the steps of:

substituting electrostatic filtration units, for dry electrostatic precipitation, each comprising a precharger and a downstream particle collector having wires of from $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter for said electrostatic precipitator, said substituted units being designed so as to occupy less space in the housing that said electrostatic filter lacking a precharger, thereby leaving free space within said housing between a

one of said prechargers which is first downstream from said entry port and said exit port;

inserting an acidic gas removal means, within said housing, essentially entirely within said free space between said entry port and said one of said prechargers, said acidic gas removing means having a means for spraying an acidic gas neutralizing agent, in water droplets having a diameter of



from 5 to 60 micrometers, into said flue gas drying means for maintaining said wires in an essentially dry state, said drying means including a reaction zone of sufficient length for said neutralizing agent in water and the acidic gases to react and form a wet neutral salts and for said water to evaporate from said wet neutral salts to form dry neutral salts, for removal by said electrostatic filtration units.

4,885,140

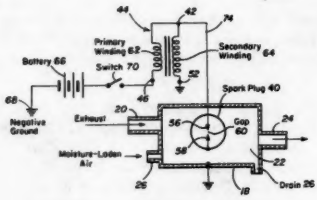
EXHAUST TREATING APPARATUS

William R. Brown, 1018 W. Jackson St., Muncie, Ind. 47305

Filed Apr. 14, 1986, Ser. No. 852,020

Int. Cl.[4] F01N *3/08*

U.S. Cl. 422—174 **6 Claims**



1. In combination with an electrically grounded housing enclosing a chamber through which fluent products are conducted together with an inflow of moisture to establish variable electrical conductivity within the chamber, a spark plug mounted within the housing having electrodes spaced from each other by a gap within said chamber, transformer means having a secondary winding and a primary winding, and a DC source of voltage connected to the primary winding, the improvement comprising a ground terminal directly connected to the secondary winding and a juncture interconnecting the primary and secondary windings in series between the DC voltage source and the ground terminal to load the voltage source and voltage fluctuating means operatively connecting one of the electrodes of the spark plug in series with the primary winding for loading thereof as a function of said variable conductivity within the chamber between the other of the electrodes and the grounded housing to induce a spark generating voltage in the secondary winding applied across the gap of the spark plug.

4,885,141

WATER TREATMENT IN AQUEOUS HEAT TRANSFER APPARATUS

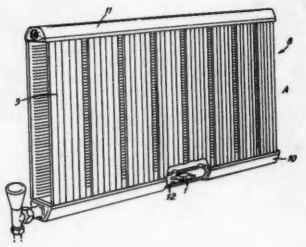
Alan Gray, Amersham, and Alfred J. Arch, Ongar, both of England, assignors to Alcan International Limited, Montreal, Canada

Filed May 13, 1988, Ser. No. 193,881

Claims priority, application United Kingdom, May 22, 1987, 8712198

Int. Cl.[4] B01D *11/02*

U.S. Cl. 422—263 **8 Claims**



1. A capsule for the treatment of water in an aqueous heat transfer apparatus, said capsule comprising a container of at least two separate compartments, a water treatment material contained in each of said compartments, and locating means attached to the container for securely locating the capsule within a passage forming part of the heat transfer apparatus, each said compartment having at last one surface open to the exterior, each said surface being covered by a cover, and retaining means for retaining each cover in position to form a sealed compartment for containing said water treatment material, each said cover being formed of a controlled release glass which dissolves upon exposure of the capsule to water to release said water treatment material from said compartment, the time taken for at least one controlled release glass cover to dissolve being different from that for the remainder.

4,885,142

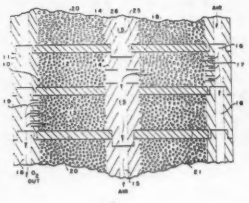
APPARATUS IN THE FORM OF A DISK FOR THE SEPARATION OF OXYGEN FROM OTHER GASES AND/OR FOR THE PUMPING OF OXYGEN AND THE METHOD OF REMOVING THE OXYGEN

Jerry W. Suitor, El Toro; C. Martin Berdahl, Sierra Madre, and Wilbur J. Marner, Arcadia, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 791,709, Oct. 28, 1985, abandoned. This application Oct. 24, 1986, Ser. No. 923,160

Int. Cl.[4] C01B *13/00*

U.S. Cl. 423—219 **15 Claims**



13. A method of removing oxygen from a feedstock containing oxygen comprising:

a. providing a disk of oxygen conductive solid electrolyte material;

b. contacting a peripheral portion of said disk with a feedstock containing oxygen in a manner such that said feedstock moves radially inwardly from points around the periphery toward the center of said disk; and,

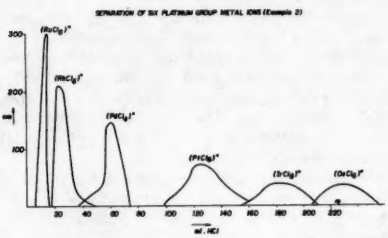
c. applying a current to said disk in a manner such that oxygen is removed from said feedstock containing oxygen through said disk to an output side thereof.

4,885,143

METHOD FOR THE INTERSEPARATION OF PLATINUM GROUP METALS

Gabriella Schmuckler, Haifa, Israel, assignor to Technion Research and Development Foundation Ltd., Haifa, Israel

Filed Jul. 12, 1988, Ser. No. 220,384
Claims priority, application Israel, Aug. 6, 1987, 83449
Int. Cl.[4] C22B *11/04*
U.S. Cl. 423—22 9 Claims



1. A method for the interseparation of platinum-group metals from a gold-free halide solution containing at least two noble metals (PGMs), comprising passing said solution through at least one chromatographic column containing a solid adsorbent with a Kd above 1, which adsorbs the PGMs, and subsequently eluting the loaded adsorbent by a halide salt solution, to obtain thereby separate fractions, each fraction containing only one single noble metal and coming out in the order: Ru, Rh, Pd, Pt, Ir and Cs.

4,885,144

PROCESS FOR PURIFYING MOLYBDENUM

John Cheresnowsky, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 21, 1987, Ser. No. 99,266
Int. Cl.[4] C01G *39/00*; B01D *11/14*
U.S. Cl. 423—54 5 Claims

1. A process for purifying molybdenum containing arsenic and phosphorus, said process comprising:

(a) adding to an acidic slurry of molybdenum trioxide, a source of magnesium ions in a solid form, with the amount of magnesium and the magnesium ion concentration in the subsequently formed ammonium molybdate solution being sufficient to subsequently form insoluble compounds containing greater than about 80% by weight of the arsenic and greater than about 80% by weight of the phosphorus, and ammonia in an amount sufficient to subsequently dissolve the molybdenum and subsequently form said insoluble compounds, with said source of magnesium ions being added prior to the addition of said ammonia;

(b) digesting the resulting ammoniated slurry at a temperature sufficient to dissolve the molybdenum and form an ammonium molybdate solution while the pH is maintained at from about 9 to about 10 to form a solid containing said insoluble compounds; and

(c) separating said solid from said ammonium molybdate solution.

4,885,145

METHOD FOR PROVIDING OXYGEN ION VACANCIES IN LANTHANIDE OXIDES

D. Alan R. Kay, 4305 Lakeshore Rd., Burlington, Canada, and William G. Wilson, 820 Harden Dr., Pittsburgh, Pa. 15229

Continuation-in-part of Ser. No. 846,272, Mar. 31, 1986, Pat. No. 4,714,598, which is a division of Ser. No. 718,989, Apr. 2, 1985, Pat. No. 4,604,268, which is a continuation-in-part of Ser. No. 521,751, Aug. 8, 1983, Pat. No. 4,507,149, which is a continuation-in-part of Ser. No. 471,773, Mar. 3, 1983, which is a continuation of Ser. No. 174,024, Jul. 31, 1980, Pat. No. 4,397,683. This application Sep. 23, 1987, Ser. No. 100,291
Int. Cl.[4] C01B *17/16, 31/20, 17/00*; C01F *17/00*
U.S. Cl. 423—230 18 Claims

1. A method for the desulfurization of fuel gases resulting from the incomplete combustion of sulfur containing hydrocarbons comprising the steps of:

(a) creating oxygen ion vacancies in a lanthanide oxide; and

(b) reacting the fuel gases with the lanthanide oxide containing the oxygen ion vacancies whereby the amount of sulfur in the gases is reduced.

4,885,146

PROCESS FOR SCRUBBING OF NO AND/OR SO_2 FROM GAS MIXTURES

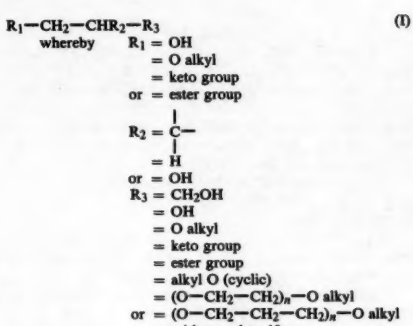
Eberhard Lassmann, Eurasburg; Robert Helmling, and Franz Beran, both of Munich, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 911,837, Sep. 26, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 174,474
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1985, 3534526; Apr. 10, 1986, 3612123
Int. Cl.[4] C01B *21/00, 17/00*
U.S. Cl. 423—235 65 Claims

1. A process for removal of, an atmospheric pollutant from a gas, said atmospheric pollutant being at least one of NO_x and SO_2, comprising

contacting said gas mixture with a scrubbing agent so as to remove said at least one of NO_x and SO_2 from said gas, said scrubbing agent including iron(II) ions and a substantially water-free nonaqueous solvent and

wherein said nonaqueous solvent is selected from the group consisting of dimethyl sulfoxide, phosphoric or phosphonic esters, a compound of formula I or II, or mixtures thereof



(I)

whereby R_1 = OH
= O alkyl
= keto group
or = ester group

R_2 = C(=O)H
= H
or = OH

R_3 = CH_2OH
= OH
= O alkyl
= keto group
= ester group
= alkyl O (cyclic)
= $(O-CH_2-CH_2)_n-O$ alkyl
or = $(O-CH_2-CH_2-CH_2)_n-O$ alkyl
with n = 1 to 10;

-continued

$R_4—CH_2—CH_2—CH_2—R_5$ (II)

whereby R_4 = OH
= O alkyl
= keto group
or = ester group
R_5 = OH
= O alkyl
= keto group
= ester group
= $(O—CH_2—CH_2—CH_2)_n—O$ alkyl
or = $(O—CH_2—CH_2)_n—O$ alkyl
with n = 1 to 10.

4,885,147

PROCESS FOR PREPARING A LARGE-GRAINED UO_2 FUEL

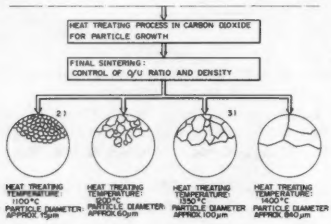
Hirohiko Murakami, Mito; Toru Ogawa, Hidachi, and Kousaku Fukuda, Mito, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,640

Claims priority, application Japan, Nov. 12, 1987, 62-284190

Int. Cl.[4] C01G *43/025, 43/01;* **G21G** *4/00;* **C09K** *11/04*

U.S. Cl. 423—261 **9 Claims**


HEAT TREATING PROCESS IN CARBON DIOXIDE FOR PARTICLE GROWTH
FINAL SINTERING: CONTROL OF O/U RATIO AND DENSITY
2
3
HEAT TREATING TEMPERATURE: 1100°C
PARTICLE DIAMETER: APPROX. 15μm
HEAT TREATING TEMPERATURE: 1300°C
PARTICLE DIAMETER: APPROX. 60μm
HEAT TREATING TEMPERATURE: 1350°C
PARTICLE DIAMETER APPROX. 100μm
HEAT TREATING TEMPERATURE: 1400°C
PARTICLE DIAMETER APPROX. 840μm

1. A process for producing large-grained, low-density UO_2 micro-fuel spheres, said micro-fuel spheres having an average grain diameter of at least 5 μm, which comprises:

(a) isothermally heating one or more UO_2 micro-fuel spheres in a stream consisting essentially of carbon dioxide for a time and at a temperature sufficient to produce grains having an increased average grain diameter of greater than 5 μm, without substantially increasing the density of said micro-fuel spheres; and then

(b) sintering said produced grains, in the absence of a sintering additive, in a reducing gas stream for a time and at a temperature sufficient to regulate both the ratio of oxygen to uranium in the produced grains, and the density of the grains.

4,885,148

PRODUCTION OF MONOBASIC POTASSIUM PHOSPHATE WITH LOW CHLORIDE CONTENT FROM POTASSIUM CHLORIDE AND PHOSPHORIC ACID PRODUCED FROM THE COMMERCIAL WET PROCESS

William R. Erickson; Donald B. Stain, and James D. Wilson, all of Lakeland, Fla., assignors to Phosphate Engineering & Construction Co., Inc., Lakeland, Fla.

Filed Sep. 6, 1988, Ser. No. 240,609

Int. Cl.[4] C01B *15/16, 25/26*

U.S. Cl. 423—309 **19 Claims**

1. A process of producing monopotassium phosphate having a low chloride content from potassium chloride and wet process phosphoric acid comprising the steps of:

a. Combining 52–54% phosphoric acid with potassium chloride in a reactor to form a mixture;

b. Supplying heat to the mixture so as to drive off HCl and form a slurry including insoluble metallic impurity compounds, monopotassium phosphate, unreacted potassium chloride and unreacted phosphoric acid;

c. Dissolving the slurry in a dissolution tank;

d. Separating the insoluble metallic impurity compounds from the slurry and recovering a pregnant mother liquor containing monopotassium phosphates, unreacted potassium chlorides and unreacted phosphoric acid;

e. Precipitating the monopotassium phosphate from the pregnant mother liquor to form a barren mother liquor and recovering the monopotassium phosphate.

4,885,149

RECOVERY AND PURIFICATION OF SILICA

Anthony S. W. De Freitas; Archibald W. McCulloch, and Alister G. McInnes, all of Halifax, Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne des Brevets et D'Exploitation Limited, Canada

Filed Dec. 9, 1987, Ser. No. 131,026

Claims priority, application Canada, Dec. 16, 1986, 525427

Int. Cl.[4] C01B *33/12*

U.S. Cl. 423—339 **17 Claims**

1. A process for obtaining silica which process comprises:

(a) acidifying a basic aqueous solution containing silicate ions and molybdate ions to bring the pH of the solution to no more than 2 and to produce silicomolybdic acid;

(b) adding to the acidified solution an organic base containing a trialkylammonium or tetraalkylammonium counterion, said counterion containing C_1 to C_4 alkyl groups to precipitate a silicomolybdate; and

(c) washing and drying the precipitate of step (b) and then heating the precipitate stepwise to about 350° C. and then to about 1000° to drive off volatile impurities and leave a residue of silica.

4,885,150

STABLE THIOCYANOGEN COMPOSITION

Steven L. Brewster, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 13,487, Feb. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 834,983, Feb. 28, 1986, abandoned. This application Oct. 13, 1988, Ser. No. 256,895

Int. Cl.[4] C09K *15/16, 15/26, 15/22;* **C01B** *21/093*

U.S. Cl. 423—366 **30 Claims**

1. A stable thiocyanating composition comprising in combination (a) thiocyanogen or a thiocyanogen halide with (b) an α,β-unsaturated ketone in (c) an inert organic solvent.

4,885,151

DIAGNOSTIC AID FOR THE SCINTIGRAPHIC VISUALIZATION OF MALIGNANT TUMORS COMPRISING THE SUBSTANCE OBTAINED FROM ENZYMATIC PROCESSING OF MUREIN USING HEN'S EGGWHITE LYSOZYME

Erich Oberhausen, Homburg/Saar; Ludwig Kuhlmann, Hofheim am Taunus; Gerhard Seibert, Darmstadt; Axel Steinstrasser, Liederbach; Hans-Joachim Schroth, Hanau, and Karl-Heinz Bremer, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 25, 1987, Ser. No. 66,185

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621570

Int. Cl.[4] A61K *49/02;* **C09K** *11/04*

U.S. Cl. 424—1.1 **5 Claims**

1. A diagnostic aid for the scintigraphic visualization of malignant tumors, which contains a radionuclide which has been bonded by means of a complex-forming agent to the substance obtained by the enzymatic processing of murein with enzyme consisting essentially of hen's eggwhite lysozyme.

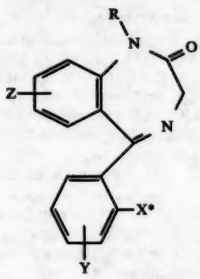
4,885,152

RADIOACTIVE BENZODIAZEPINE DERIVATIVES

Iwao Nakatsuka, Kobe; Masami Okuno, Osaka; Kunio Shiba, Takarazuka, and Akira Yoshitake, Kyoto, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 5, 1988, Ser. No. 253,773
Claims priority, application Japan, Oct. 19, 1987, 62-263543
Int. Cl.[4] A61K *49/02*; C07D *243/24*
U.S. Cl. 424—1.1 6 Claims

1. A radioactive benzodiazepine derivative represented by the formula (I):



(I)

wherein R is hydrogen or a lower alkyl; X* is radioactive iodine or bromine; Y is hydrogen or a halogen; and Z is a halogen or nitro group and the salt thereof.

4,885,153

RADIOHALOGENATED FOR PROTEINS

Daniel S. Wilbur; Alan R. Fritzberg, both of Edmonds, and David S. Jones, Seattle, all of Wash., assignors to Neorx Corporation, Wash.

Continuation of Ser. No. 852,740, Apr. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 735,392, May 17, 1985, abandoned. This application Apr. 13, 1989, Ser. No. 338,497
Int. Cl.[4] A61K *49/02, 43/00, 39/395*
U.S. Cl. 424—1.1 24 Claims

1. A substantially pure radiohalogenated protein produced by covalently linking a protein and a compound having the formula:

*X—Ar—R

wherein

Ar is an aromatic or heteroaromatic ring;

R is a chemical bond or a substituent containing 1 to 12 straight-chain carbon atoms that does not activate Ar to electrophilic substitution on the order produced by hydroxy or amino substitution of the ring, wherein said bond or said substituent has attached thereto a functional group suitable for covalent linkage to a protein under conditions that preserve the biological activity of the protein, said functional group selected from phenolic ester, imide ester, imidate ester, anhydride, acylsuccinimide, aldehyde, isothiocyanate, thiol, diazo, amine, hydrazine, alkyl halide and maleimide; and

*X is a radioisotope of iodine, bromine, fluorine or astatine and is para- or meta-positioned relative to substituent R.

4,885,154

METHOD FOR REDUCING SENSITIZATION OR IRRITATION IN TRANSDERMAL DRUG DELIVERY AND MEANS THEREFOR

Michel J. N. Cormier, Palo Alto, Calif.; Philip W. Ledger, Mountain View, Calif.; Alfred Amkraut, Palo Alto, Calif., and Jean P. Marty, Sceaux, France, assignors to Alza Corporation, Palo Alto, Calif.

Filed Mar. 1, 1988, Ser. No. 162,777
Int. Cl.[4] A61K *31/135, 31/05*
U.S. Cl. 424—10 8 Claims

1. A method of reducing human skin sensitization or irritation during transdermal administration of a drug to a human, which drug is susceptible to metabolism by an enzyme in the skin and formation of a sensitizing or irritating drug metabolite when the drug is transdermally administered at a therapeutically effective rate, comprising administering to a selected site on the skin of a human in need thereof:

(a) a therapeutically effective amount of the drug, at a therapeutically effective rate over a predetermined period of time; and

(b) an effective amount of a metabolic modulator capable of inhibiting the enzyme that metabolizes said drug, at a rate which is capable of inhibiting the metabolism of the drug by the enzyme during the period of time when the drug is transdermally administered, and thereby inhibiting the formation of the sensitizing or irritating drug metabolite.

4,885,155

ANTICALCULUS COMPOSITIONS USING PYROPHOSPHATE SALT

John J. Parran, Jr., Cincinnati, and Nabil Y. Sakkab, Loveland, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 59,909, Jun. 9, 1987, Pat. No. 4,806,339, which is a division of Ser. No. 839,111, Mar. 12, 1986, Pat. No. 4,684,518, which is a continuation of Ser. No. 702,708, Feb. 19, 1985, Pat. No. 4,590,066, which is a continuation of Ser. No. 591,228, Mar. 19, 1984, Pat. No. 4,515,772, which is a continuation of Ser. No. 391,040, Jun. 22, 1982, abandoned. This application Feb. 8, 1989, Ser. No. 308,162
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.[4] A61K *7/16, 7/18*
U.S. Cl. 424—52 10 Claims

1. In an aqueous oral pyrophosphate and fluoride anticalculus dentifrice composition having a pH of from about 6 to about 10 comprising:

(a) from about 10% to about 70% of a dental abrasive compatible with fluoride and pyrophosphate ions selected from the group consisting of β-phase calcium pyrophosphate, particulate thermosetting resins, silicas, alumina, insoluble metaphosphates and mixtures thereof; and

(b) an amount of a fluoride ion source sufficient to provide from about 50 ppm to about 3500 ppm fluoride ions;

wherein the improvement comprises the composition containing a mixture of tetra sodium and tetra potassium pyrophosphate with these salts being present in amounts effective, at least 1.5% of pyrophosphate ions being provided, to inhibit the formation of dental tartar or calculus at the gingival margin and wherein more tetrapotassium pyrophosphate than tetrasodium pyrophosphate is used.

4,885,156
MOUTHWASH SOLUTION

Risto M. Kotilainen, Kuopio, and Kaj R. Lilius, Espoo, both of Finland, assignors to Suomen Calcussan Oy-Finska Calcussan AB, Finland

PCT No. PCT/FI87/00092, § 371 Date Mar. 2, 1988, § 102(e) Date Mar. 2, 1988, PCT Pub. No. WO88/00044, PCT Pub. Date Jan. 14, 1988
PCT Filed Jul. 7, 1987, Ser. No. 165,280
Claims priority, application Finland, Jul. 8, 1986, 862881
Int. Cl.[4] A61K 7/16
U.S. Cl. 424—54 1 Claim

1. In a method for preventing enrichment of metals, in an oral cavity on mucous membranes and dental surfaces, the improvement comprising the step of

administering to patients allergic to metals dissolving from their metallic amalgam with fillings, bridges, crowns, dentures, or other prostheses until the patients' symptoms of allergic reaction to the metal are concluded, a mouthwash solution containing at least one water-soluble alkali metal or alkali earth salt of an amino(carboxylic) acid selected from the group consisting of salts of iminodiacetic acid (IDA), nitrilotriacetic acid (NTA) or iminotriacetic acid (ITA), ethylenediamine-N,N'-diacetic acid, ethylenediaminetetraacetic acid (EDTA), diethylenetriaminepentaacetic acid (DPTA), 2-hydroxyethylethylenediamine-triacetic acid (HEDTA), ethylenediamine (EN), N,N'-diethylenediamine, diethylene-triamine (DEN), diethylenetetraamine (TRIEN), beta,beta',beta''-triamino-triethylamine (TREN), propylenediamine, salicylic acid, salicylaldehyde and derivatives thereof, citric acid, acetylacetone, o-aminophenyl, and condensed phosphates, and mixtures thereof,

in an amount effective in twice a day mouthrinse for forming, with heavy metal ions, stable, water-soluble complex compounds under oral cavity conditions.

4,885,157
DERMAL COSMETIC COMPOSITION AND APPLICATIONS THEREFOR

Mary G. Fiaschetti, 12206 Cedar Gap Ln., Houston, Tex. 77072

Filed Feb. 13, 1987, Ser. No. 14,302
Int. Cl.[4] A61K 7/40, 7/42, 7/44, 7/48
U.S. Cl. 424—59 16 Claims

1. A beautifying and moisturing composition for dermal application, which comprises cosmetic effective amounts of the following components in parts by weight:

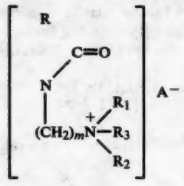
live yeast cells,	about 5 to about 8 parts
selenium,	about ¼ to about ¾ part
carotene,	about ¾ to about 1¼ parts
RNA,	about 2 to about 4 parts
DNA,	about 1 to about 3 parts
water and	about 2 to about 6 parts
albumen,	about ¾ to about 2¼ parts.

4,885,158
HEAT STABLE QUATERNIZED LACTAMS HAVING OXYLATED SULFUR ANIONS

David J. Tracy, Lincoln Park; Thomas Rizzo, Bloomfield, and Robert B. Login, Oakland, all of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Apr. 29, 1988, Ser. No. 188,522
Int. Cl.[4] A61K 7/075; D06M 13/40; C07D 223/10
U.S. Cl. 424—69 20 Claims

1. A quaternized lactam having the formula:



wherein m is an integer having a value of from 1 to 4; R is alkylene having from 3 to 8 carbon atoms and is optionally substituted with C_1 to C_4 alkyl; R_1, R_2 and R_3 are each independently selected from the group of alkyl, alkyloxyalkyl, alkyloxyalkenyl, hydroxyalkyl, aryl, aralkyl, alkaryl, alkyl amidoalkyl, alkyl carbamoylalkyl, aryl amido alkyl and aryl carbamoylalkyl radicals, and R_2 and R_3, together with the quaternized nitrogen atom can form a saturated or unsaturated 5 to 10 membered monocyclic ring; a 9 to 10 membered bicyclic ring or a 13 to 14 membered tricyclic ring, which rings may contain a carbonyl group and which rings are optionally substituted with lower alkyl, amino or amido, at least one of said rings containing from 1 to 2 heteroatoms selected from the group of nitrogen, sulfur and oxygen, and, where the quaternized nitrogen atom in the heterocyclic structure is doubly bonded to an adjacent ring atom, R_1 represents one bond of said double bond in the heterocyclic structure, otherwise R_1 bonded to the quaternized nitrogen in a heterocyclic structure is any of the aforementioned individual groups for R_1, R_2 and R_3; said groups R_1, R_2 and R_3 each having from 1 to 30 carbon atoms and at least one of R_1, R_2 and R_3 is a radical having from 8 to 30 carbon atoms when R_2 and R_3 are not part of a heterocyclic moiety; and A^- *is an anion derived from an oxylated sulfur compound, having the formula*:

$R'SO_3^-$

wherein R' is alkyl, alkoxy, phenyl, phenoxy, alkylphenyl, alkylphenoxy, phenylalkyl, phenoxyalkyl, C_{12} to C_{20} α-olefin or mixtures thereof and wherein the alkyl moieties of said R' groups contain from 1 to 20 carbon atoms and said R' groups are optionally alkoxylated with from 1 to 20 units of ethyleneoxide and/or propylene oxide.

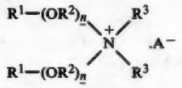
6. The process of adding a sufficient conditioning and heat stabilized amount of the compound of claim 1 to a cosmetic formulation.

4,885,159
HIAR COSMETIC COMPOSITION

Miyuki Miyake, Narashino; Haruhiko Toda, Chiba, and Minako Yasu, Tokyo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,337
Claims priority, application Japan, Feb. 2, 1987, 62-22166
Int. Cl.[4] A61K 7/06, 9/14, 9/50
U.S. Cl. 424—70 7 Claims

1. A hair cosmetic composition comprising a polymer vesicle obtained by the polymerization of a surfactant monomer vesicle having the formula (I):



(I)

wherein R_1 represents a linear or branched alkyl or alkylaryl having 8 to 32 carbon atoms, R^2 represents alkyl having 2 to 3 carbon atoms, n is an integer of 0 to 5, R_3 represents an alkyl having 1 to 4 carbon atoms $—(OR_2)_nH$, and a counter ion A

represents an organic acid type anion having a polymerizable group.

4,885,160

WRAPPING LOTION AND METHOD FOR PERMANENT WAVING

Barry W. Williams, Chicago, Ill., and Pamela M. Daniels, Gary, Ind., assignors to Soft Sheen Products, Inc., Chicago, Ill.

Filed Feb. 19, 1988, Ser. No. 157,899
Int. Cl.[4] A61K *7/09*; A05D *7/04*
U.S. Cl. 424—72 **13 Claims**

1. A process for waving hair, comprising the following steps in combination:

(a) applying to the hair a rearranging composition with chemical properties sufficient to break the cystine bonds in the hair keratin;

(b) rinsing the hair to a substantially remove the rearranging composition;

(c) applying a wrapping lotion composition to the hair, said wrapping lotion comprises a homogeneous mixture which includes a salt of thioglycolic acid and a guar component;

(d) wrapping the hair around a rod to produce a curl pattern and allowing the hair and wrapping lotion to set for a predetermined length of time;

(e) rinsing the wrapped hair;

(f) applying a neutralizer composition to the curl pattern; and

(g) rinsing the hair to substantially remove the neutralizer composition;

whereby the process produces thicker, fuller hair with loose, bouncy curls.

4,885,161

WOUND DRESSINGS IN GELLED PASTE FORM

John Cornell, West Chester, Pa., assignor to Medi-Tech International Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 24,268, Mar. 11, 1987, abandoned. This application Jan. 6, 1989, Ser. No. 294,907
Int. Cl.[4] A61K *31/74*
U.S. Cl. 424—78 **14 Claims**

1. A gelled paste composition for dressing skin wounds comprising:

(i) a non-cross-linked, nonionic polyacrylamide or polymethacrylamide;

(ii) a cross-linked salt of polyacrylic or polymethacrylic acid; and

(iii) water, the ratio of (i) to (ii) ranging from about 1:2.5 to 1:10 and the ratio of (iii) to the sum of (i) plus (ii) ranging from about 10:1 to 1:3.

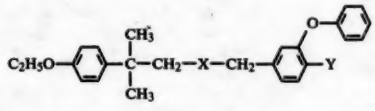
4,885,162

POLYOLEFIN RESIN COMPOSITIONS

Yoichi Kawai; Takatoshi Udagawa; Takeshi Imakita, all of Kanagawa, Japan, and Sachio Yokote, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 31,091, Mar. 26, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 262,119
Int. Cl.[4] A01N *31/14*
U.S. Cl. 424—83 **7 Claims**

1. A polyolefin resin composition which comprises; 100 parts by weight of a polyolefin resin and 0.0001 to 10 parts by weight of an organic compound of the formula:



wherein

X represents an oxygen atom or —CH_2— and Y represents a hydrogen or fluorine atom;

said resin being selected from the group consisting of high-density polyethylene, low-density polyethylene, medium-density polyethylene, polypropylene, ethylene/propylene copolymer, ethylene/butene-1 copolymer, polybutene-1 and poly(4-methylpentene-1).

4,885,163

TOPICAL USE OF IGF-II FOR WOUND HEALING

Carl J. Shaar, and Michele C. Smith, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 24, 1987, Ser. No. 18,251
Int. Cl.[4] A61K *39/00, 45/02*
U.S. Cl. 514—2 **14 Claims**

1. A pharmaceutical formulation comprising insulin-like growth factor-II (IGF-II) and a pharmaceutically acceptable carrier suitable for topical administration.

4,885,164

AQUEOUS PROTEIN SOLUTIONS STABLE TO DENATURATION

Horst Thurow, Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

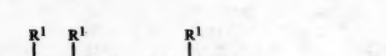
Continuation of Ser. No. 564,346, Dec. 21, 1983, Pat. No. 4,783,441, which is a continuation of Ser. No. 263,720, May 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 144,040, Apr. 28, 1980, abandoned. This application Dec. 22, 1987, Ser. No. 136,673
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 2917535; Dec. 22, 1979, 2952119
The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.
Int. Cl.[4] A61K *39/00, 35/12, 37/00, 37/26*
U.S. Cl. 424—85.4 **8 Claims**

1. A sterile aqueous solution of a water soluble biologically active protein, which solution has a pH between 6.8 and 8 and additionally has admixed therewith from 2 to 500 ppm of a surface active compound of the formula

$$R^2Y—X_n—R^3$$

whereby said solution is stabilized to motion conditions, wherein

X_n is a chain of n members selected from the group of members having the formula



in any sequence,

n is 2 to 80,

Y is —O— or —NH—,

R^1 is —H, —CH_3, or —C_2H_5, and may be the same or different but is such that at least one-half of the members of the chain X_n contains —CH_3 or —C_2H_5, and

R^2 and R^3 are each members independently selected from the group consisting of hydrogen, alkyl having 1 to 20 carbon atoms, carboxyalkyl having 2 to 20 carbon atoms, and alkylphenyl having 1 to 10 alkyl carbon atoms, but wherein R^2 may only be such alkyl if Y is —NH—.

4,885,165

PRODUCTION OF ANTI-VIRAL AND ANTI-BACTERIAL AGENTS IN COMBINATION

Simon Skurkovich, 261 Congressional La., #709, Rockville, Md. 20852

Continuation-in-part of Ser. No. 240,106, Mar. 3, 1981, abandoned. This application Dec. 12, 1984, Ser. No. 680,830

Int. Cl.[4] A61K *45/02, 39/395, 39/42*

U.S. Cl. 424—85.4 18 Claims

1. A method of obtaining a disease control product from a warm blooded donor animal comprising the steps of:

(a) administering to the donor animal a first substance for inducing in the blood stream of the animal an antibody for controlling bacterial disease, and a second substance for inducing in the blood stream of the animal an interferon for controlling viral disease,

(b) awaiting an incubation period until a recoverable quantity of said product comprised of said antibody and interferon is generated,

(c) extracting a blood substance from the donor animal, and

(d) treating the extracted blood substance to recover the product.

4,885,166

HYBRID INTERFERONS

Francois Meyer, Zürich; Albert Hinnen, Basel; Andreas Meister, Riehen; Markus G. Grütter, Hochwald, and Sefik Alkan, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 5, 1986, Ser. No. 871,059

Claims priority, application United Kingdom, Jun. 11, 1985, 8514722; Jun. 11, 1985, 8514723; Jun. 11, 1985, 8514724; Jun. 11, 1985, 8514725; Jun. 11, 1985, 8514726

Int. Cl.[4] A61K *45/02;* C07K *13/00, 15/26;* C12N *21/00*

U.S. Cl. 424—85.7 8 Claims

1. A hybrid interferon polypeptide having an amino acid sequence composed of two to four sub-sequence corresponding in amino acid identity and number to sub-sequence of human lymphoblastoid interferons LyIFN-α-2 and LyIFN-α-3, said hybrid interferon polypeptide being selected from the group consisting of a polypeptide having an amino acid sequence consisting of amino acids 1 to 150 of LyIFN-α-2 and amino acids 151 to 166 of LyIFN-α-3, a polypeptide having an amino acid sequence consisting of amino acids 1 to 92 of LyIFN-α-2, amino acids 93 to 150 of LyIFN-α-3 and amino acids 151 to 166 of LyIFN-α-2, and a polypeptide having an amino acid sequence consisting of amino acids 1 to 60 of LyIFN-α-2, amino acids 60 to 92 of LyIFN-α-3, amino acids 93 to 150 of LyIFN-α-2 or of LyIFN-α-3 and amino acids 151 to 166 of LyIFN-α-2 or of LyIFN-α-3.

8. A pharmaceutical preparation for the treatment of viral infections or neoplastic diseases comprising an antivirally or antiproliferatively effective amount of a hybrid interferon according to claim 1 together with a pharmaceutically acceptable carrier.

4,885,167

RESTORATION OF IMPAIRED CARDIAC FUNCTION OF PATIENTS WITH DIVERSE MUSCULAR DYSTROPHIES BY THERAPY WITH COENZYME Q10

Karl Folkers, Austin, Tex., and Janusz Wolaniuk, Indianapolis, Ind., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 725,059, Apr. 19, 1985, abandoned. This application Feb. 16, 1988, Ser. No. 155,891

Int. Cl.[4] A61K *37/48*

U.S. Cl. 424—94.1 1 Claim

1. A method for treating impaired cardiac function of human patients having the Duchenne dystrophy, the Becker dystrophy, the limb-girdle dystrophies, myotonic dystrophy, Charcot-Marie-Tooth disease fascioscapulohumoral muscular disease, hypotonia congenitale or Welander disease, or a closely related disease, said method comprising administering to the patients having any one of these dystrophies or myopathies a therapeutically effective amount of a formulation consisting essentially of coenzyme Q_{10}.

4,885,168

METHOD FOR THE REMOVAL OF NUCLEIC ACIDS AND/OR ENDOTOXIN

Masanori Hashimoto, Yamato; Takeshi Yamamoto, Takatsuki; Toru Kawachi, Yamato; Junji Kuwashima, Toyonaka, and Hirokazu Kitaoka, Hirakata, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka and Kurita Water Industries Ltd., Tokyo, both of, Japan

Filed Apr. 1, 1987, Ser. No. 34,217

Claims priority, application Japan, Apr. 2, 1986, 61-75779

Int. Cl.[4] A61K *35/00*

U.S. Cl. 424—95 7 Claims

1. A method for the removal of nucleic acids and endotoxin from a liquid containing same and proteins which comprises adding sufficient amount of a low molecular weight chitosan having an intrinsic viscosity of 0.01 to 5 dl/g into the liquid to precipitate the nucleic acids and endotoxin present in the liquid and separating off said precipitate, thereby retaining a substantial portion of the proteins in said liquid.

4,885,169

COSMETIC COMPOSITION CONTAINING GLYCOPROTEINS FOR THE SKIN CARE

Giovanni Gazzani, Como, Italy, assignor to Crinos Industria Farmacobiologica Spa., Como, Italy

Filed Jan. 4, 1985, Ser. No. 688,738

Claims priority, application Italy, Jan. 9, 1984, 19076 A/84

Int. Cl.[4] A61K *35/38*

U.S. Cl. 424—104 7 Claims

1. A cosmetic composition for hydrating the skin, comprising at least one naturally derived, purified glycoprotein substantially free of low molecular weight products and having been isolated from the gastric mucosa or duodenum of mammals by:

(a) hydrolyzing said mucosa or duodenum in water at a temperature of 50° C. to 100° C. for 10 minutes to 45 minutes at a pH of 1 to 10;

(b) removing acidic products of the hydrolysis; and

(c) diluting the product of step (b) with a non-solvent for the glycoprotein to precipitate said glycoprotein, said composition containing also water and at least one hygrostatic excipient, said composition being characterized by its ability to remain on the skin for an extended period of time.

4,885,170

ANTIBIOTIC A80509

Robert L. Hamill, Greenwood, and Raymond C. Yao, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 24, 1988, Ser. No. 172,677

Int. Cl.[4] A61K *35/74;* C12P *1/06*

U.S. Cl. 424—117 9 Claims

1. Antibiotic A80509 which has the following characteristics

State: white amorphous powder (lyophilized)

Mp: 147°–148° C.

pKa: =6.7 (66% aqueous dimethylformamide) $[\alpha]^{25}D$: +35.1° (c 10, MeOH) Mol. wt.: 856 (field desorption and fast atom bombardment mass spectrometry)

Empirical formula: $C_{42}H_{57}N_6O_9ClS$

UV (EtOH): 336 nm (ε5,070); acid−241 (ε12,600) and 311 (ε4,750)

IR ($CHCl_3$) See FIG. 1; or a or salt of A80509.

4,885,171

USE OF RAPAMYCIN IN TREATMENT OF CERTAIN TUMORS

Sehgal N. Surendra, Dollard Des Ormeaux, and Claude Vezina, Oka, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 126,276, Mar. 3, 1980, abandoned, which is a continuation of Ser. No. 957,626, Nov. 3, 1978, abandoned. This application Mar. 22, 1984, Ser. No. 592,193

Int. Cl.[4] A61K *35/74*

U.S. Cl. 424—122 7 Claims

1. A method of treating transplanted tumors in a transplanted tumor bearing mammal, wherein said tumor is selected from lymphatic leukemia, colon, mammary, melanocarcinoma and ependymoblastoma tumors which comprises administering to said mammal an antitumor effective amount of rapamycin.

4,885,172

COMPOSITION FOR TARGETING, STORING AND LOADING OF LIPOSOMES

Marcel B. Bally; Helen Loughrey, and Pieter R. Cullis, all of Vancouver, Canada, assignors to The Liposome Company, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 811,037, Dec. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 749,161, Jun. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 759,419, Jul. 26, 1985. This application Dec. 15, 1986, Ser. No. 941,913

Int. Cl.[4] A61K *37/22;* B32B *5/16;* A01N *25/26, 25/28*

U.S. Cl. 424—417 25 Claims

1. A streptavidin-coupled liposome.

4,885,173

METHODS AND COMPOSITIONS FOR NONINVASIVE DOSE-TO-EFFECT ADMINISTRATION OF DRUGS WITH CARDIOVASCULAR OR RENAL VASCULAR ACTIVITIES

Theodore H. Stanley, Salt Lake City, and Brian Hague, West Valley City, both of Utah, assignors to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 729,301, May 1, 1985, Pat. No. 4,671,953. This application Jun. 8, 1987, Ser. No. 60,046

Int. Cl.[4] A61K *9/68*

U.S. Cl. 424—440 53 Claims

1. A method for administering a potent drug capable of inducing rapidly a predetermined systemic modification of cardiovascular or renal vascular functions in a patient, the method comprising the steps of:

obtaining a soluble matrix material in the form of a lollipop into which the potent drug has been dispersed, said soluble matrix material being capable of releasing the drug for absorption through mucosal tissues of the mouth, pharynx, and esophagus;

providing the drug-containing lollipop to the patient to whom the drug is to be administered in order to induce rapidly the predetermined systemic modification of the cardiovascular or renal vascular functions of the patient;

administering the drug-containing lollipop to the patient in a manner such that the lollipop is dissolved so that the drug is absorbed through the mucosal tissues of the mouth, pharynx, and esophagus, thereby entering the patient's bloodstream, said administering step being accomplished in a dose-to-effect manner;

controlling the rate of dissolution of the drug-containing lollipop in a dose-to-effect manner in order to obtain the predetermined systemic modification of cardiovascular or renal vascular functions of the patient while accounting for the patient's susceptibility to the cardiovascular or renal vascular drug and the patient's individual subjective experience of the cardiovascular or renal vascular functions; and

modifying the rate of dissolution of the drug-containing lollipop in response to the predetermined systemic modifications of cardiovascular or renal vascular functions of the patient.

4,885,174

PERCUTANEOUS PENETRATION ENHANCER OF OLEIC ACID AND 2-ETHYL-1,3-HEXANEDIOL

Nicholas Bodor, Gainesville, Fla., and Thorsteinn Loftsson, Reykjavik, Iceland, assignors to Key Pharmaceuticals, Inc., Kenilworth, N.J.

Division of Ser. No. 806,257, Dec. 6, 1985, Pat. No. 4,764,381. This application May 25, 1988, Ser. No. 198,798

Int. Cl.[4] A61M *7/00;* A61K *31/58;* A61L *15/03;* A61F *13/00*

U.S. Cl. 424—449 3 Claims

1. A transdermal delivery system, comprising:

a pharmaceutical active ingredient; and

a carrier wherein the carrier is comprised of 2-ethyl-1,3-hexanediol in an amount of 50% or more based on the weight of the carrier and oleic acid in an amount of 1 to 40% by weight based on the weight of the carrier.

4,885,175

METHOD OF MAKING CHEWING GUM WITH WAX-COATED DELAYED RELEASE INGREDIENTS

Steven E. Zibell, Palos Heights, Ill., assignor to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Dec. 23, 1987, Ser. No. 137,114

Int. Cl.[4] A23G *3/30*

U.S. Cl. 426—5 24 Claims

1. A method of making chewing gum with a waxed-coated delayed release ingredient comprising the following steps:

mixing a quantity of a powdered ingredient, said powdered ingredient being selected from the group consisting of high-potency sweeteners, flavors, and acidulants, as well as mixtures thereof, with a quantity of molten wax, which wax has a melting point above about 130° F. to produce a damp mix wherein the quantity of the powdered ingredient is between about 50 and about 90 weight percent of the damp mix and the quantity of molten wax is selected so as to produce a damp mix which is characterized as being dust free, non-flowing, and crumbly, and wherein the quantity of powdered ingredient and the molten wax remain above the melting point of the wax until completely mixed;

allowing the damp mix to harden;

comminuting the hardened mix to thereby obtain wax-coated particles of the ingredient within a particle size range suitable for use in chewing gum; and

incorporating the wax-coated particles in a chewing gum formulation.

4,885,176

METHOD OF MAKING BREAD

Hirofumi Nakakura, Osaka; Morio Shibata, Amagasaki; Haruo Ishikawa, Kawanishi; Akihisa Nakano; Hiromi Hiroto, both of Osaka, and Hajime Oyabu, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 19, 1987, Ser. No. 64,253

Claims priority, application Japan, Jun. 20, 1986, 61-145127; Jun. 24, 1986, 61-147319; Dec. 18, 1986, 61-305117; Dec. 18, 1986, 61-300041; Dec. 20, 1986, 61-300037; Dec. 23, 1986, 61-305518; Dec. 24, 1986, 61-306212; Dec. 26, 1986, 61-315762; Dec. 26, 1986, 61-315763; Jan. 30, 1987, 62-20806

Int. Cl.[4] D21D *2/00*

U.S. Cl. 426—19 7 Claims

1. A method of making bread, comprising the steps of:

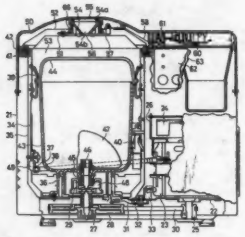
(a) kneading bread ingredients and an amount of water higher than normal into a first dough;

(b) adding solely dry yeast to said first dough;

(c) kneading said first dough and said dry yeast into a second dough;

(d) fermenting said second dough;

(e) releasing a gas from said second dough while the second dough is being fermented; and



(f) baking said second dough after the second dough has been fermented.

4,885,177

NATURAL CORN ROOTWORM CONTROL

Gary J. Wegmann, R.R. 2, Box 205, Earlville, Iowa 52041

Filed May 9, 1988, Ser. No. 191,343

Int. Cl.[4] A61K *35/78, 35/60*

U.S. Cl. 424—95 **18 Claims**

1. A method of rootworm control, which comprises:

treating the ground surrounding seed corn with a small but rootworm controlling effective amount of a treating composition of soybean meal and fish meal which includes triglyceride oil.

4,885,178

METHOD OF MAKING A SOYBEAN PROTEIN FOOD PRODUCT

Tatuo Emura, Sapporo, and Kiyoshi Ohba, Chitose, both of Japan, assignors to Kabushiki Kaisha Hokkaido Nissin, Hokkaido, Japan

Filed Mar. 14, 1988, Ser. No. 167,508

Int. Cl.[4] A23J *3/00*; A23L *1/20*

U.S. Cl. 426—46 **3 Claims**

1. A method of producing a soybean protein food product comprising the steps of:

preparing a soybean protein solution by liquifying a soybean protein powder so that the soybean concentration amounts to 7.5%;

admixing 2% lactose, 25% solid fat, and 2% emulsifier based upon said fat, with said soybean portein solusion, to thereby provide a base material;

sterilizing said base material by heating the same at 80° C. for 30 min.;

thereafter, homogenizing said base material at a pressure of 150 kg/cm^2 at a temperature of 70° C.;

then, placing said base material in a thermostatic container, and maintaining it therein at a temperature of 40° C. under a pH condition of pH 6.5–pH 6.6 and approximately 0.2 acidity;

adding 2–3% lactic acid bacteria under a pH condition of pH 4.5–pH 4.7 and approximately 0.75 acidity;

leaving said base material for about 30 min.;

preparing a soybean protein clotting enzyme solution by adding 0.03–0.06% powdered soybean protein clotting enzyme into 0.2M NaCl solution;

when said pH and acidity is about pH 6.4 and about 0.2–0.25, respectively, adding said soybean protein clotting enzyme solution into said base material;

thereafter, when said base material is clotted into a curd, cutting said curd into plural pieces and leaving them to stand for about 30 min., allowing separation of a whey therefrom;

thereafter, mounting said plural pieces of curd onto a mold device comprising a flat upper die and a lower die of a substantially top-ended cubic shape having plural holes perforated in its lateral walls and bottom wall; and

lowering said upper die downwardly into said lower die, to thereby press said curd at a pressure of 4–5 kg/cm^2 for about 10 hrs. at an ambient temperature of 12°–15° C.

4,885,179

METHOD OF MAKING FIBROUS PROTEIN XANTHAN GUM COMPLEXES

William G. Soucie, Gurnee; Wen-Sherng Chen, Glenview; Vernon C. Witte, Naperville; George A. Henry, Wilmette, and William D. Drehkoff, Glencoe, all of Ill., assignors to Kraft, Inc., Glenview, Ill.

Division of Ser. No. 24,507, Mar. 1, 1987, which is a continuation-in-part of Ser. No. 567,096, Dec. 30, 1983, Pat. No. 4,563,360, and a continuation-in-part of Ser. No. 567,277, Dec. 30, 1983, Pat. No. 4,559,233. This application Apr. 4, 1988, Ser. No. 177,184

The portion of the term of this patent subsequent to Jan. 7, 2003, has been disclaimed.

Int. Cl.[4] A23J *3/00*

U.S. Cl. 426—104 **10 Claims**

1. A method for manufacturing edible xanthan/protein complex fibers comprising the steps of

providing an aqueous xanthan/protein fiber complex generating solution comprising one or more solubilized edible proteins selected from the group consisting of vegetable proteins, dairy proteins, egg proteins and mixtures thereof having isoelectric points in the range of from about 3 to about 12 and a solubilized xanthan gum hydrocolloid, the total weight of said solubilized protein and xanthan gum hydrocolloid components being in the range of from about 0.1 weight percent to about 4 weight percent based on the total weight of said xanthan/protein fiber complex generating solution, said xanthan/protein fiber complex generating solution having a specific conductance of less than 0.9 mho per centimeter,

adjusting the pH of sadd xanthan/protein complex fiber generating solution to a pH value at which said solubilized protein and said solubilized xanthan gum form an insoluble fibrous complex to provide xanthan/protein complex fibers and a whey solution, said solubilized xanthan gum and said solubilized protein being present in said xanthan/-protein fiber complex generating solution prior to said pH adjustment in suitable proportion to spontaneously form xanthan/protein complex fibers upon said pH adjustment which synerese to produce fibers having a lower water content than that of said xanthan/protein fiber complex generating solution prior to said pH adjustment, and

separating the xanthan/protein complex fibers from the whey solution.

4,885,180

MICROWAVEABLE BAKED GOODS

Stuart A. Cochran, East Windsor, N.J.; Earl J. Benjamin, New Rochelle, N.Y.; Mary E. Crocker, Hamilton, N.J.; William C. Seidel, Monsey, N.Y., and Vicki L. Cipriano, E. Brunswick, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 26, 1987, Ser. No. 89,643

Int. Cl.[4] A21D *6/00*

U.S. Cl. 426—241 **7 Claims**

1. An improved self stable, refrigerated or frozen baked good which will substantially retain its palatability upon microwave reheating wherein the improvement comprises the incorporation into the batte or dough of the baked good an effective amount of a chemically-modified starch, with the exception of modified starches which are crosslinked only, to reduce substantially deteriorization in the palatability of the baked good upon microwave reheating whereby the baked and reheated baked good closely resembles a freshly baked product

4,885,181

PROCESS FOR DECAFFEINATING GREEN COFFEE

Louris Kaper, Barneveld, Netherlands, assignor to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel, N.V., Utrecht, Netherlands

Continuation of Ser. No. 55,879, Jun. 1, 1987, abandoned. This application Jan. 25, 1989, Ser. No. 300,722

Claims priority, application Netherlands, May 30, 1986, 8601400; May 30, 1986, 8601401; Jul. 8, 1986, 8601783; Aug. 6, 1986, 8602011

Int. Cl.[4] A23F *5/22*

U.S. Cl. 426—422 5 Claims

1. A process for decaffeinating aqueous green coffee extract which comprises:

(a) treating said extract with activated carbon recycled from step (d) wherein the caffeine is largely absorbed by the activated carbon to form caffeine-loaded activated carbon;

(b) treating said caffeine-loaded activated carbon with an acid, or a mixture of one or more acids selected from the group consisting of acetic acid, citric acid, lactic acid, phosphoric acid, and benzoic acid whereby the caffeine is largely removed from the said caffeine-loaded carbon;

(c) washing the said activated carbon with water until it has a pH ranging from 3 to 5.5;

(d) recycling the activated carbon to step (a) whereby the steps (a) through (d) are repeated more than ten times without thermal regeneration.

4,885,182

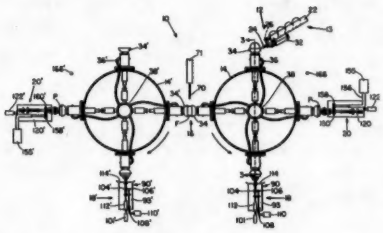
METHOD OF AND APPARATUS FOR EXTRACTING JUICE AND MEAT FROM A FRUIT

Michael S. Kolodesh; Walter Cash, Jr.; Jerry E. Davis, all of Cincinnati, Ohio; Peter G. Gosselin, Springfield, Mass.; Ronald W. Kock, Wyoming; Bruce A. Pierson, Cincinnati, both of Ohio; H. Norman Reiboldt, College Corner; David A. Sabatelli, Cleves, both of Ohio, and Douglas Toms, St. Bernard, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Jun. 3, 1988, Ser. No. 202,172

Int. Cl.[4] A23L *2/06;* A23N *1/00*

U.S. Cl. 426—482 33 Claims



21. A method of extracting fruit meat from a fruit, said method comprising the steps of:

(a) loading a fruit into a first resilient cup;

(b) grasping said fruit between said first resilient cup and a second resilient cup;

(c) slicing said fruit into two approximately equal halves, each fruit half having an outer peel and an exposed fruit meat section;

(d) placing said fruit half adjacent to a coring element having a sharp peripheral edge; and

(e) pivoting said coring element, whereby said sharp peripheral edge of said coring element cuts through said exposed inner meat section of said fruit half and thereby extracts a major portion of said fruit meat section from said fruit half, a minor portion of said fruit meat section remaining within said outer peel.

4,885,183

METHOD FOR CONTROLLING MELTING PROPERTIES OF PROCESS CHEESE

John J. Strandholm, Morton Grove; Robert R. Prochnow, Deerfield; Mark S. Miller, Arlington Heights; Lawrence E. Woodford, Palatine, and Steven M. Neunaber, Morton Grove, all of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Oct. 19, 1988, Ser. No. 259,975

Int. Cl.[4] A23C *19/08, 19/084*

U.S. Cl. 426—582 10 Claims

1. A method for restricting the meltability of process cheese products comprising preparing a process cheese blend having undenatured beta-lactoglobulin and heating said process cheese blend to a predetermined temperature for a predetermined time sufficient to substantially denature and cross-link said beta-lactoglobulin, said undenatured beta-lactoglobulin being present at a level sufficient to provide at least about 0.5% of cross-linked beta-lactoglobulin in said process cheese product when said process cheese product is subjected to said predetermined time and temperature conditions.

4,885,184

PROCESS FOR PREPARING MALT LIQUEUR

Hugo Patino, Lakewood; George E. Heard, Golden; Finn B. Knudsen, Lakewood, and H. Stephen Gress, Westminster, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Jun. 21, 1988, Ser. No. 209,508

Int. Cl.[4] C12G *3/06*

U.S. Cl. 426—592 3 Claims

1. A process for preparing a malt liqueur from a fermented wort produced form a mash initially comprising at least about 40 wt. % barley malt, the process comprising the sequential steps of:

(a) filtering and treating the fermented wort to produce a liquid comprising alcohol and water which can be freeze concentrated;

(b) sufficiently cooking the liquid to cause freeze concentration by freezing a portion of the water therein to theereby produce a quantity of ice crystals in the liquid and increase alcohol concentration of the liquid; and

(c) separating the ice crystals from the liquid and mixing at least one flavoring agent and a sweetening agent into the liquid, wherein the flavoring agent is chosen from the group consisting of peach, pear, apple, pineapple, amaretto, orange, brandy, Irish coffee, cherry, raspberry, coffee, and chocolate mint.

4,885,185

METHOD OF MAKING SOYBEAN MILK

Kiyoshi Kitazume; Yasuharu Nakamura, both of Chiba; Hiromichi Ochiai, Tokyo, and Hisashi Nozaki, Saitama, all of Japan, assignors to Kabushikikaisha Kibun, Tokyo, Japan

Continuation of Ser. No. 908,619, Sep. 10, 1986, abandoned. This application Feb. 3, 1989, Ser. No. 305,980

Claims priority, application Japan, Sep. 21, 1985, 60-207763

Int. Cl.[4] A23L *1/20*

U.S. Cl. 426—598 4 Claims

1. In a process for preparing soybean milk comprising grinding soybeans in a hot aqueous medium and removing bean-curd refuse, the improvement wherein comprising:

crushing at 85°–90° C. in an aqueous medium, soybeans having significant amounts of active lipoxidase and active trypsin inhibiting enzyme therein, into square pieces having a size in the order of 0.2 to 2.0 mm in an aqueous medium and substantially deactivating said active lipoxidase by maintaining the resulting crushed slurry at 85° to 90° C. for between 30 seconds and 2 minutes without substantially deactivating said active trypsin inhibiting enzyme, extracting soybean protein by grinding the slurry containing said significant amount of said trypsin inhibiting enzyme, removing bean-curd refuse from the slurry, and substantially deactivating said active trypsin inhibit-

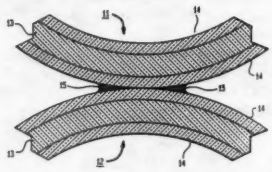
ing enzyme by sterilizing the resulting soybean milk by indirect heating.

4,885,186

METHOD FOR PREPARATION OF SILICATE GLASSES OF CONTROLLED INDEX OF REFRACTION

Brian G. Bagley, Watchung Boro, and William E. Quinn, Middlesex Boro, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Dec. 29, 1988, Ser. No. 291,630
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—38 **3 Claims**



1. Method for the preparation of silicate glass of controlled index of refraction which comprises the steps of

(a) curing an organo-silicon polymer containing a phosphorous or boron source at a temperature ranging from 200°–250° C.,

(b) exposing said cured resin to an air or oxygen plasma in a barrel reactor at room temperature, so resulting in the formation of a fenestrated structure having an index of refraction ranging down to 1.38, and

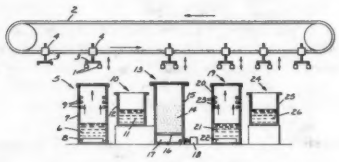
(c) sintering said structure at a temperature within the range of 500°–1000° C. to effect an increase in the refractive index to a desired value ranging up to and exceeding the refractive index of bulk fused silica.

4,885,187

PROCESS FOR COATING ELECTRICAL BUS BARS AND THE LIKE

Timothy A. Koenig, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 7, 1988, Ser. No. 267,579
Int. Cl.[4] B05D 5/12, 1/06, 1/24, 3/02
U.S. Cl. 427—58 **14 Claims**



1. A process for coating selected portions of the surface of a substrate comprising the steps of:

(A) heating a substrate to a temperature that is sufficient to cause gelling of a gelable, liquid masking composition and sufficient to cause a fusible powdered resin to bond to said substrate surface;

(B) subsequently coating with said liquid masking composition one or more areas of the surface of said substrate which are not to be coated with said fusible powdered resin, whereby said liquid masking composition begins to gel upon contact with the hot substrate and continues to gel until it forms a removable mask;

(C) then coating the hot substrate with said fusible powdered resin, whereby said fusible powdered resin is deposited on and adheres to one or more areas of the surface of said substrate that are not coated with said liquid masking composition;

(D) cooling said substrate; and

(E) removing said mask from said substrate.

4,885,188

PROCESS FOR FORMING THIN FILM OF METAL SULFIDES

Yo Hasegawa, Nara; Kazuyuki Okano, Katano; Akira Nakanishi, and Hiroshi Hatase, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP86/00015, § 371 Date Aug. 29, 1986, § 102(e) Date Aug. 29, 1986, PCT Pub. No. WO86/04362, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 16, 1986, Ser. No. 910,215
Claims priority, application Japan, Jan. 17, 1985, 60-6417; Jan. 17, 1985, 60-6441; Jan. 17, 1985, 60-6444
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—126.1 **4 Claims**

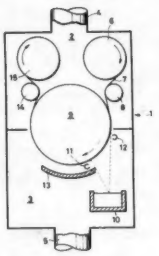
1. A process for forming a thin film of a metal sulfide, which comprises coating a substrate with a layer of a solution including an organometallic compound having at least one metal-sulfur bond in the molecule, and then thermally decomposing said organometallic compound layer in an inert gas mixed with hydrogen sulfide to form a thin film of a metal sulfide.

4,885,189

METHOD OF PRODUCING MAGNETIC RECORDING MEDIA

Tadashi Yasunaga, and Ryuji Shirahata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 21, 1987, Ser. No. 110,820
Claims priority, application Japan, Oct. 21, 1986, 61-249874; Oct. 24, 1986, 61-252848
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—129 **12 Claims**



1. A method for producing a magnetic recording medium, comprising the steps of: (1) preparing, by takeup evaporation, a takeup evaporated article comprising a flexible substrate coated with a magnetic metal/alloy thin film rolled around a first reel, under a takeup tension of 13.5×10^{-8} b/t Kg-weight or more when said magnetic metal/alloy thin film is provided on said flexible substrate, wherein b is the width (in mm) of said flexible substrate and t is the thickness (in m) of said flexible substrate; (2) rewinding said coated flexible substrate on a second reel under a takeup tension of 13.5×10^{-8} b/t Kg-weight or less; and (3) preserving said rewound coated flexible substrate in an oxidation accelerating atmosphere.

4,885,190

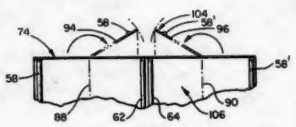
METHOD FOR PRODUCING EXPANDABLE HONEYCOMB MATERIAL

John T. Schnebly, Boulder, Colo., assignor to Thermocell, Ltd., Broomfield, Colo.

Division of Ser. No. 844,187, Mar. 26, 1986, Pat. No. 4,732,630. This application Jan. 20, 1988, Ser. No. 147,106

Int. Cl.[4] B32B *31/18*

U.S. Cl. 427—207.1 **5 Claims**



1. A process for forming spools of folded generally flat tubular material for producing expandable honeycomb material, said process comprising the steps of:

heating the surface of a continuous strip of material to be used as honeycomb material;

applying adhesive in a plurality of lines along the length of said continuous strip of material;

chilling said material after application of said adhesive to cool and solidify said adhesive;

cutting the width of said material into continuous tapes each being approximately twice the width of the desired expandable honeycomb material; and

folding each said tape longitudinally along opposite lateral side portions into a generally flat tubular form having upper and lower layers with lines of adhesive being disposed on the surface of each said upper and lower layer.

4,885,191

PIGMENT COATED WITH POLYCYANOACRYLATE AND A PROCESS FOR COATING PIGMENTS

Wolfgang Podszun, and Helmut Waniczek, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 851,474, Apr. 14, 1986, abandoned. This application May 24, 1988, Ser. No. 189,105

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514886

Int. Cl.[4] B05D *7/00*

U.S. Cl. 427—212 **8 Claims**

1. A process for coating a basic or neutral pigment comprising

first forming a dispersion comprising the pigment in an aprotic medium containing a cyanoacrylate monomer and a dispersion auxiliary, where the pigment has a particle size of 20 to 80 nm and where the dispersion auxiliary is a soluble polymer formed from at least one (meth) acrylic acid ester,

then coating the thus-formed dispersed pigment by polymerizing cyanoacrylate.

4,885,192

DEVICE FOR PRODUCING THREE DIMENSIONAL LANDSCAPE SCENES

William J. Tabar, 4845 Wren Cir. #2, Salt Lake City, Utah 84117

Filed Jul. 27, 1987, Ser. No. 78,913

Int. Cl.[4] G09F *19/00*

U.S. Cl. 428—13 **36 Claims**

1. A device for producing an artwork design having an appearance resembling a three-dimensional landscape scene, said device comprising:

a pair of plates having opposing planar, interior surfaces in approximate parallel orientation, at least one of said plates being visually transparent;

said plates having a separation distance between the opposing planar interior surfaces of between 0.02 and 0.06 inches, thereby forming an enclosed plate volume;

particulate matter disposed within a portion of the enclosed volume and being operable as design-forming material, said matter being comprised of particles having at least two different particle sizes and of compositions of at least two different densities;

said particulate matter including (i) shading particles for defining darker features within the design and (ii) contrast particles for providing a variety of lighter features in contrast to the darker features;

said shading particles having a mesh size within the range of 60 to 150 and a specific gravity within the range of 3.0 to 7.0;

said contrast particles having a plurality of mesh sizes within the range of 60 to 240 and a plurality of specific gravities within the range of 3.0 to 7.0;

said contrast particles including (i) fine particles having a specific gravity of less than 3.0 and mesh sizes within the range of 150 to 240 and (ii) moderate sized particles having a specific gravity of greater than 3.0 and mesh sizes within the range of 70 to 150;

a liquid medium disposed within the plate volume in combination with the particulate matter, said liquid being inert with respect to the particulate matter;

a quantity of buoyancy elements entrained within the liquid medium and having a sufficiently small size and geometric configuration to permit free movement throughout the plate volume and within the particulate matter and liquid, said quantity being sufficient to enable formation of a substantially continuous line of contiguous buoyancy elements across a full length of the plate volume; and

means for sealing a peripheral edge of the plate volume to retain the liquid/particulate/buoyancy element mixture therein.

4,885,193

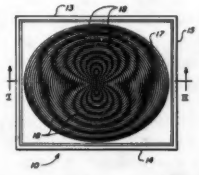
ART FORM AND METHOD OF PRODUCING SAME

Richard M. Head, 7753 Bisbee Rd., Scottsdale, Ariz. 85258

Filed Nov. 2, 1987, Ser. No. 115,828

Int. Cl.[4] B43L *9/00*

U.S. Cl. 428—14 **20 Claims**



1. A new art form comprising a backing sheet having a first precisely generated planar pattern imposed thereupon; a first transparent sheet having a second precisely generated planar pattern imposed thereupon, said second planar pattern being

discernibly different from said first planar pattern and disposed in fixed relationship to said first planar pattern so that a viewer facing said transparent sheet from each of a plurality of vantage points observes a different one of a plurality of optical effects resulting from the visual coaction of said first pattern with said second pattern.

4,885,194

RE-ENTERABLE CLOSURE ASSEMBLY

Dexter C. Tight, Jr., Palo Alto, and Marc F. Moisson, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 21, 1982, Ser. No. 341,407
Int. Cl.[4] B32B *1/08*
U.S. Cl. 428—34.9 **14 Claims**

1. A liner for internally supporting a recoverable sleeve in a closure assembly including an adhesive which seals the closure assembly upon recovery of the sleeve, the liner comprising a laminate of:

(A) a re-usable support, the support accessible after a recovery of the recoverable sleeve by the removal of at least a portion of the sleeve and a disposable outer layer; and

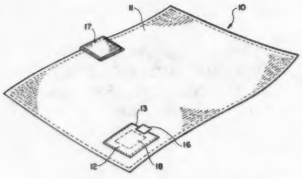
(B) a disposable outer layer, capable of fitting within a recoverable sleeve, held in position with respect to the support such that it is separable therefrom without damage to the support subsequent to recovering the sleeve and melting the adhesive, the sleeve being disposed around the liner subsequent to the recovery of the sleeve.

4,885,195

EXERCISE TOWEL WITH MAGNETIC ANCHORING MEANS

Nicholas D. Change, III, 21592 Marilla St., Chatsworth, Calif. 91311

Filed Jul. 21, 1988, Ser. No. 222,026
Int. Cl.[4] B32B *3/06*
U.S. Cl. 428—36.1 **1 Claim**



1. An accessory for use by a person performing an exercise procedure comprising the combination of:

an elongated length of tufted material having edge marginal regions defining opposite roughened surfaces;

magnetic anchoring means carried on said edge marginal regions for radiating a magnetic force field immediately about said anchoring means;

said anchoring means includes a pocket carried on one surface of said material fully and solely enclosing and holding said magnetic means;

said magnetic anchoring means is a permanent magnetic enclosing and carried in said pocket on said edge marginal region in engagement with said material opposite surfaces;

a hook and pile closure incorporated into said pocket for selectively opening and closing access into said pocket;

said magnetic anchoring means is a circular magnetic insertably received into and carried by said pocket;

a second pocket carried at one end of said material having an open end for insertably receiving personal items;

closure means on said second pocket for releasably closing said pocket open end; and

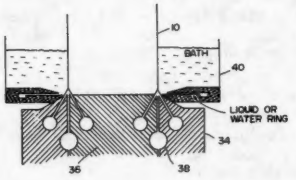
a display area on said second pocket for carrying selective indicia and graphic representations.

4,885,196

THREE-LAYER CROSS-LAMINATED FILM WITH FOAM CORE MADE BY COUNTER-ROTATING DIES

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 7, 1988, Ser. No. 203,183
Int. Cl.[4] B32B *5/20*; B29C *67/22, 47/06*
U.S. Cl. 428—36.5 **26 Claims**



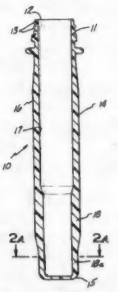
1. A high-strength, cross-laminated tubular thermoplastic film material with a film core, comprising an outer film material layer and at least one inner film material layer, each said layer of film material being uniaxially oriented in a generally different direction with regard to each other; and a foamed adhesive material being interposed between said film layers so as to produce a bond therebetween.

4,885,197

PLASTIC PREFORM FOR FORMING BLOW MOLDED PLASTIC BOTTLES

Herbert Strassheimer, Windermere, Fla., assignor to Plasticon Patents, S.A., Geneva, Switzerland

Filed Oct. 26, 1988, Ser. No. 262,781
Int. Cl.[4] B65D *1/02, 23/00*
U.S. Cl. 428—36.92 **8 Claims**



1. A plastic preform for forming blow molded plastic bottles which comprises: a neck portion defining an opening; a tubular body portion depending therefrom; and an integral bottom structure depending from the tubular body portion wherein said tubular body portion includes a lower portion with a

thickened portion in said lower portion; said preform having an outside wall face and an inside wall face with the inside wall face of the tubular body portion adjacent the bottom structure and extending onto said bottom structure having a plurality of flat faces with terminal portions thereof; and scallop-shaped segments connecting the terminal portions of each flat face adapted to deform upon exposure to stresses prior to deformation of the flat faces and thereby become subject to an increased rate and degree of orientation.

4,885,198

SHEETS FOR USE IN CORRESPONDENCE

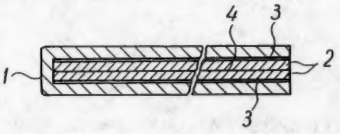
Yoshikazu Kimura, 36 Takada-cho, Karahashi, Minami-ku, Kyoto 601, Japan

Filed Jul. 21, 1988, Ser. No. 222,548

Claims priority, application Japan, Jul. 31, 1987, 62-193028; Feb. 22, 1988, 63-39106; Feb. 22, 1988, 63-39107

Int. Cl.[4] B32B *3/04, 3/06*

U.S. Cl. 428—77 **4 Claims**



1. Sheets for use in correspondence comprising:

a twice folded sheet having an edge;

clear resin films coated on inside each-other-facing surfaces of the twice-folded sheet in a manner that they can hardly be peeled off; and

a temporary adhesive layer which connects the clear resin films in a manner that the clear resin films can be later peeled apart to form a peeled surface;

wherein the peeled surface has no tackiness.

4,885,199

FIBER-REINFORCED SILICON NITRIDE COMPOSITE CERAMICS

Normand D. Corbin, Northborough, and Craig A. Willkens, Webster, both of Mass., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 893,747, Aug. 6, 1986, which is a continuation-in-part of Ser. No. 692,441, Jan. 17, 1985, abandoned. This application Nov. 26, 1986, Ser. No. 935,652

Int. Cl.[4] C04B *35/56, 35/58, 35/80;* **B32B** *9/00*

U.S. Cl. 428—113 **14 Claims**

1. A fiber reinforced composite, comprising:

(a) from 20–80% by volume of reinforcing silicon carbide ceramic fibers at least one millimeter in average length, said fibers collectively having sufficient tensile strength to bear the load on said composite at the point of matrix failure without fiber tensile failure, said fibers having a diameter between 8 and 25 microns;

(b) crack deflection zones, having mechanical properties substantially different from those of both the matrix and the reinforcing fibers of the composite, occupying a predominant portion of the space in the order of 1 micron thick around said reinforcing fibers; and

(c) a matrix comprising predominantly reaction bonded silicon nitride, said composite having non-catastrophic failure under mechanical stress, wherein said reinforcing fibers consist predominantly of silicon carbide derived from decomposition of organosilicon polymers, and wherein said crack deflection zones are comprised predominantly of a material with its most probable direction of slip under mechanical stress substantially parallel to the surfaces of said reinforcing fibers.

4,885,200

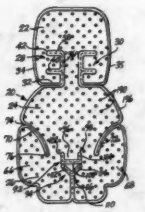
INFANT CAR SEAT LINER

Lee E. Perdelwitz, Jr., Tacoma, Wash., and David E. Hanke, San Diego, Calif., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Apr. 29, 1988, Ser. No. 188,473

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—136 **46 Claims**



1. A disposable infant seat liner for car seats of the type having a pair of shoulder straps and at least one leg strap comprising:

a body of sheet material including a liquid permeable facing sheet, an absorbent core comprising fiber material and a liquid impermeable backing sheet, the body including an upper shoulder supporting section with first and second side edges, a central section and a lower leg supporting section;

means defining a first shoulder strap receiving pathway extending inwardly along a first path section toward the center of the body from the first side edge of the upper body section to a first location, upwardly from the first location along a second path section to a second location and outwardly from the second location along a third path section toward the first side edge, and terminating short of the first side edge, the first shoulder strap receiving pathway also including a fourth path section between the first and third path sections and extending outwardly toward the first side edge from the second path section, the fourth path section terminating short of the first side edge; and

means defining a second shoulder strap receiving pathway extending from the second side edge of the upper body section, the second shoulder strap receiving pathway being like the first shoulder strap receiving pathway.

4,885,201

FILM MADE FROM A WELDABLE POLYMER MATERIAL WITH PROJECTIONS

Michael Brandt, Seevetal, Fed. Rep. of Germany, assignor to SLT North America Inc., Conroe, Tex.

Continuation of Ser. No. 68,657, Jul. 1, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 258,096

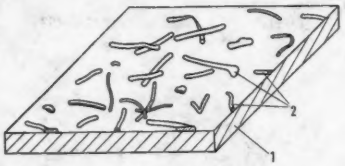
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622559

Int. Cl.[4] B32B *27/40*

U.S. Cl. 428—143 **11 Claims**

1. An increased friction, damage resistant film comprising a

film substrate having at least one film surface; a plurality of friction-increasing projections attached to said film surface by



a plurality of welds characterized by a welding factor of significantly below 1.

4,885,202

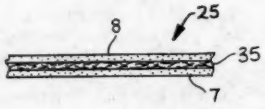
TISSUE LAMINATE

William D. Lloyd, Neenah, Wis., and David A. Nuttal, Roswell, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 24, 1987, Ser. No. 124,739

Int. Cl.[4] B32B *5/14*

U.S. Cl. 428—171 3 Claims



1. A composite tissue product comprising two outer tissue plies, each of which is intimately overall thermally bonded to a layer of meltblown fibers, said composite tissue product being additionally thermally bonded together at select points.

4,885,203

LIGHTWEIGHT FIRED BUILDING PRODUCTS

George H. Wakat, Saint Paul Park, Minn., assignor to Applied Ultralight Technologies, Inc., Minneapolis, Minn.

Filed Jul. 1, 1987, Ser. No. 68,429

Int. Cl.[4] B05D *3/02;* F23M *5/02;* B32B *5/16*

U.S. Cl. 428—220 38 Claims

1. A fired, polycrystalline building product sintered to hardness in a kiln to a predetermined product temperature and formed of a substantially homogeneous combination comprising water and a mixture of binding medium and ceramic microspheres obtained from fly ash residue produced as a result of coal combustion, said microspheres having a melting point in excess of said product temperature, said microspheres having an alkali oxide content wherein the total weight of said alkali oxide content does not exceed 6% of the weight of said microspheres.

4,885,204

ABSORBENT PRODUCT WITH HYDROPHOBIC ACQUISITION LAYER

Peter G. Bither, Wilmington, Del.; Berne F. Ellers, Orkelljunga, Sweden, and Edward J. Engle, III, Hockessin, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Aug. 31, 1988, Ser. No. 238,686

Claims priority, application United Kingdom, Sep. 18, 1987, 8722004

Int. Cl.[4] A61F *13/16;* B32B *7/00*

U.S. Cl. 428—284 8 Claims

1. A laminated structure suitable for use as a component of an absorbant product comprising a hydrophobic acquisition layer adjacent to a fluid permeable top sheet, and an absorbant layer, said hydrophobic layer comprising a thermally consolidated blend of from about 5% to about 35% of a thermally bondable hydrophobic fiber selected from hydrophobic staple fibers and polyolefin pulps, and from about 65% to about 95% of wood fluff pump, based on the weight of the blend.

4,885,205

GLASS-MAT-REINFORCED THERMOPLASTIC PANELS

Ludwig Wahl, Schifferstadt, and Helmut Vogel, Bramsche, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 281,853

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741667

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—285 10 Claims

1. Fiber-reinforced thermoformable semifinished material consisting of a thermoplastic polymer and at least one layer of needled glass-fiber mat that has been symmetrically needled.

4,885,206

FOAM COMPOSITE AND MANUFACTURE THEREOF

Onno Graalmann, Dossenheim; Guenter Kreibiehl; Gerhard Turznik, both of Ludwigshafen, and Heinz Weber, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 5, 1989, Ser. No. 350,150

Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816858

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—316.6 1 Claim

1. A foam composite consisting of

(a) one or more layers of a flexible melamine formaldlehyde resin foam from 8 to 25 g/1 in density and

(b) one or more layers of a flexible polyimide foam from 8 to 40 g/1 in density.

4,885,207

BIOCOMPATIBLE PROTEIN OR LIGAND IMMOBILIZATION SYSTEM

Susan S. Johnson, E. Forest Lake, and James R. Goodman, Chicago, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Jul. 13, 1987, Ser. No. 73,251

Int. Cl.[4] B32B *33/00;* G01N *33/547*

U.S. Cl. 428—403 19 Claims

1. A method of making a support matrix for immobilization of biologically active proteins comprising coating with a polymeric alcohol a core support which is titania, titanated alumina, or a carbonaceous pyropolymer possessing recurring units containing at least carbon and hydrogen atoms deposited on a high surface area inorganic oxide, cross-linking the polymeric alcohol by reacting it with an hydroxyl-reactive cross-linking agent which is in a molar excess relative to the molar proportion of said polymeric alcohol, converting a portion of the hydroxyl groups of the cross-linked alcohol to a sulfonate ester and recovering the resulting support matrix.

15. A support matrix resulting from the method of claim 1.

16. An immobilized biologically active protein system having covalently bound biologically active protein resulting from nucleophilic displacement of sulfonate ester groups of the support matrix of claim 15 by a primary amino or sulfhydryl moiety of said protein.

4,885,208

MAGNETIC RECORDING MEDIUM

Hiroaki Araki; Kiyomi Ejiri, and Takao Ohya, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 5, 1987, Ser. No. 81,513
Claims priority, application Japan, Aug. 5, 1986, 61-184631
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—403 9 Claims

1. A magnetic recording medium comprising a non-magnetic support and a magnetic recording layer provided on the support, said magnetic recording layer comprising a binder and a ferromagnetic powder dispersed therein, wherein:

said binder comprises a vinyl chloride polymer containing 0.001 to 5.0 mol% of a repeating unit having a polar group selected from the group consisting of $—COOM^1$, $—SO_3M^1$, $—OSO_3M^1$, and $—PO(OM^1)_2$ wherein M^1 is hydrogen or an alkali metal atom and a polyurethane containing 0.001 to 5.0 mol% of a repeating unit having a polar group selected from the group consisting of $—COOM^1$, $—SO_3M^1$, $—OSO_3M^1$, and $—PO(OM^1)_2$ wherein M^1 is hydrogen or an alkali metal atom; and

said magnetic recording layer further contains 0.03 to 10 parts by weight of a compound having a polar group based on 100 parts by weight of the ferromagnetic powder, said compound having a polar group being selected from the groups consisting of benzoic acid, phthalic acid, isophthalic acid, terephthalic acid, naphthoic acid, benzenesulfonic acid, naphthalenesulfonic acid, a sodium salt thereof, and a potassium salt thereof.

4,885,209

THERMOPLASTIC SILICON RUBBER GRAFT POLYMERS (II)

Christian Lindner, Cologne; Herbert Eichenauer, Dormagen; Dieter Wittmann, Krefeld, and Volker Damrath, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1988, Ser. No. 204,022
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1987, 3720475
Int. Cl.[4] B32B 7/04
U.S. Cl. 428—420 5 Claims

1. Thermoplastic particulate graft polymers of a substrate rubber (AB), consisting of a core (A) of rubber polymer of olefinically unsaturated monomers having softening temperatures below 0° C. and a shell (B) of organopolysiloxane, and a superstrate polymer (C) of at least one ethylenically unsaturated monomer graft polymerized onto the rubber substrate (AB).

4,885,210

COMPOSITE SHEET FOR IMPERVIOUS COATING OF CONSTRUCTION COMPONENTS

Walter D. Vedove, Brussels, Belgium, assignor to Solvay & Cie. (Société Anonyme), Brussels, Belgium

Filed Apr. 22, 1987, Ser. No. 41,295
Claims priority, application France, Apr. 24, 1986, 86 06080
Int. Cl.[4] B32B 9/04, 27/08
U.S. Cl. 428—447 3 Claims

1. A composite sheet for the impervious coating of construction components which are covered with a water-repellant hydrocarbon material, the composite sheet consisting essentially of:

at least two layers which are superposed are flexible,

wherein a first layer of said at least two layers is additionally comprised of a plasticizer and a crosslinking agent, has a surface intended to be placed in contact with said water-repellant hydrocarbon material in use, has been subjected to a plasma treatment, and is substantially free from ingredients other that polyvinyl chloride, plasticizer and crosslinking agent.

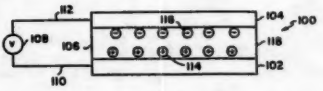
2. The composite sheet according to claim 1, wherein the crosslinking agent is selected from the group consisting of crosslinkable, esters containing allyl groups, acrylic esters and methacrylic esters.

4,885,211

ELECTROLUMINESCENT DEVICE WITH IMPROVED CATHODE

Ching W. Tang, and Steven A. VanSlyke, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 11, 1987, Ser. No. 13,530
The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.
Int. Cl.[4] B32B 15/04; H01J 1/62; H01L 29/12; C09K 11/06
U.S. Cl. 428—457 23 Claims



1. An electroluminescent device comprising in sequence, an anode, an organic hole transporting zone, an organic electron transporting zone, and a cathode, characterized in that

said cathode is comprised of a layer having a sheet resistance of less than 100 ohms per square consisting essentially of at least 50 percent magnesium and at least 0.1 percent of a metal having a work function greater than 4 eV, said metal percentages being based on total metal atoms present in said cathode layer.

4,885,212

MICROSTRUCTURALLY TOUGHENED METAL MATRIX COMPOSITE ARTICLE AND METHOD OF MAKING SAME

Karl M. Prewo, Vernon; Vincent C. Nardone, Meriden, and James R. Strife, South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 5, 1988, Ser. No. 152,781
Int. Cl.[4] B22F 3/00
U.S. Cl. 428—552 6 Claims

1. A process for making composite article comprising:

providing a metallic container, said metallic container having a substantially continuous inner surface which extends along a first axis from an open container,

positioning a plurality of longitudinally extending metallic rods along the first axis within the metallic container so that the structural elements and the container define one or more void spaces which extend along the first axis of the container,

introducing a quantity of a particulate mixture, into each of the void spaces to substantially fill each of the void spaces, said particulate mixture comprising a mixture of metallic particles and ceramic particles, and

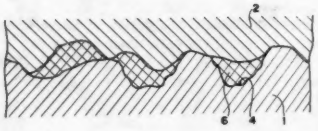
consolidating the metallic container, the metallic rods and the particulate mixture at elevated temperature and pressure to form the composite article

4,885,213

CERAMIC-SPRAYED MEMBER AND PROCESS FOR MAKING THE SAME

Noritaka Miyamoto; Miyuki Koujiya, both of Toyota; Joji Miyake, Okazaki; Takashi Iomoda, Nagoya; Hidetoshi Ohsawa, Toyota, and Tetsuo Nagami, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 28, 1988, Ser. No. 187,242
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—612 4 Claims



1. A ceramic-sprayed member having a ceramic-sprayed layer on the surface of a parent material of an aluminum alloy with an intermediate sprayed bond layer which is made of an alloy having a coefficient of thermal expansion intermediate between those of the aluminum alloy of the parent material and the ceramic of the ceramic-sprayed layer, to provide excellent adherency of the parent material surface to the ceramic;

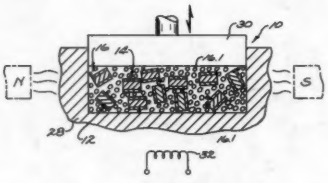
the improvement comprising a diffusion layer in which the components of said bond layer and said parent material are diffused into each other, said diffusion layer being formed in an interface between said bond layer and said parent material and occupying 20 to 50% of said interface in an area percentage; and an interface between said diffusion layer and said parent material and the interface between said bond layer and said parent material being finely roughened substantially entirely over these interfaces.

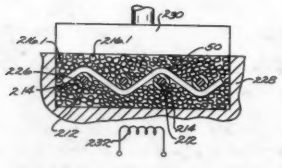
4,885,214

COMPOSITE MATERIAL AND METHODS FOR MAKING

George Trenkler, East Providence, R.I., and Richard G. Delagi, Sharon, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 10, 1988, Ser. No. 166,300
Int. Cl.[4] C22C *32/00*
U.S. Cl. 428—614 8 Claims





1. A composite metal material having discrete elements of a first metal material having respective coatings of a second material disposed thereon, the coated elements being dispersed in a metal matrix material and having a metallurgical bond between the coatings of the second metal material and the metal matrix material securing the coated elements at selected locations in the matrix material, the metallurgical bond between the coatings of the second metal material and the metal matrix material comprising a diffusion-bond forming an intermetallic compound.

4,885,215

ZN-COATED STAINLESS STEEL WELDED PIPE

Keiichi Yoshioka; Kenji Watanabe, and Yasushi Kato, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Tokyo, Japan

Filed Sep. 29, 1987, Ser. No. 102,024
Claims priority, application Japan, Oct. 1, 1986, 61-233500; Dec. 5, 1986, 61-290034; May 25, 1987, 62-127637
Int. Cl.[4] F16L *9/02*
U.S. Cl. 428—632 7 Claims

1. A welded stainless steel pipe for automotive conduits prepared by

providing a stainless steel sheet comprising a stainless steel substrate having a Vickers hardness of up to 220, and at least one coating layer formed on one surface of the steel substrate from at least one member selected from the group consisting of zinc and zinc alloys to a thickness of 0.1 to 50 μm,

roll forming the stainless steel sheet such that the coated surface faces outside, and

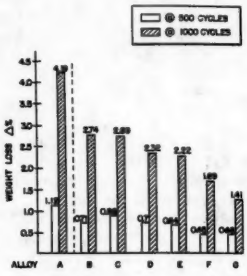
welding the roll formed stainless steel sheet along its mating edges to produce the welded pipe.

4,885,216

HIGH STRENGTH NICKEL BASE SINGLE CRYSTAL ALLOYS

Subhash K. Naik, Milford, Conn., assignor to AVCO Corporation, Providence, R.I.

Continuation-in-part of Ser. No. 34,755, Apr. 3, 1987, abandoned. This application Sep. 22, 1988, Ser. No. 247,920
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] B32B *15/01*; C22C *19/05*
U.S. Cl. 428—680 18 Claims



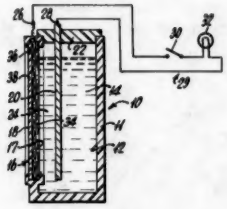
1. A single crystal alloy composition having improved oxidation/corrosion resistance and high strength at elevated temperatures consisting essentially of, by weight, about 8.0% to about 14.0% chromium; about 1.5% to about 6.0% cobalt; about 0.5% to about 2.0% molybdenum; about 3.0% to about 10.0% tungsten; about 2.5% to about 7.0% titanium; about 2.5% to about 7.0% aluminum; about 3.0% to about 6.0% tantalum; about 0.005% to about 1% each, of at least one additive from the group consisting of hafnium and silicon; from 0 to 1% yttrium; from 0 to 1% lanthanum; from 0 to 1.5% manganese, and the balance nickel.

4,885,217

AIR CATHODES AND MATERIALS THEREFOR

William H. Hoge, Flemington, N.J., assignor to Alupower, Inc., Bernardsville, N.J.

Filed Jul. 6, 1987, Ser. No. 70,183
Int. Cl.[4] H01M 4/86, 4/88
U.S. Cl. 429—27 9 Claims



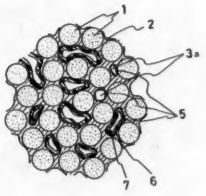
1. An air cathode comprising a sheetlike laminate including
(a) first and second layers having opposed major surfaces respectively exposed for contact with a liquid electrolyte and with air, said layers also having facing major surfaces, and said second layer being permeable to air but not to said liquid electrolyte; and
(b) current-collecting means in contact with said first layer and connectable to external electrical circuitry; wherein the improvement comprises
(c) said first layer comprising a nonwoven fibrous web impregnated with a mixture of carbon particles and a nonfibrous polymeric substance for holding the carbon particles in the web; and
(d) said facing major surfaces of said first and second layers being bonded together by heat seal coating material distributed on said facing major surfaces in such manner as to provide an array or network of areas free of coating material extending substantially uniformly thereover.

4,885,218

BATTERY EXHAUST GAS PLUG FILTER AND PROCESS FOR MANUFACTURING THE SAME

Masayasu Andou, Anjo, and Ichiro Tajima, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 24, 1988, Ser. No. 159,599
Claims priority, application Japan, Feb. 24, 1987, 62-041099
Int. Cl.[4] H01M 2/12; B05D 1/36
U.S. Cl. 429—53 15 Claims



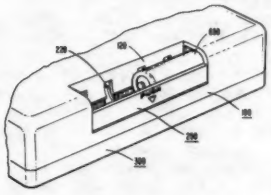
1. A porous battery exhaust gas plug filter having reduced electrolyte leakage therefrom, comprising:
an inorganic porous body having a number of pores for letting gas go through;
wherein surfaces of said pores are covered with an inner film composed of a silane coupling agent or a titanium coupling agent, and an outer film composed of a fluororesin consisting of repeating units of carbon and fluorine.

4,885,219

ROTATABLE STORAGE COMPARTMENT FOR BATTERIES AND THE LIKE

Timothy C. Miller, Greenwood, Ind., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Nov. 21, 1988, Ser. No. 274,161
Int. Cl.[4] H01M 2/10
U.S. Cl. 429—99 18 Claims



1. Apparatus for storing batteries and the like comprising:
a housing including an outside surface for enclosing objects therein, the surface having an opening for receiving one or more of said objects, the housing further including means for supporting a compartment door; and
a compartment door including shaft means positioned on opposite sides thereof for engaging the supporting means within the housing, the supporting means and the shaft means being shaped to permit rotation of the compartment door around an axis of rotation within the housing and to hold the door captive within the housing when the compartment door is opened.

4,885,220

AMORPHOUS SILICON CARBIDE ELECTRORECEPTORS

Daniel E. Kuhman, Fairport; Frank Jansen, Webster, and Steven J. Grammatica, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 25, 1988, Ser. No. 198,359
Int. Cl.[4] G03G 13/00
U.S. Cl. 430—31 25 Claims

14. An electroreceptor comprised of a hydrogenated amorphous silicon carbide with from about 10 to about 60 atomic percent of carbon, from about 10 to about 60 atomic percent of hydrogen, and from about 10 to about 80 atomic percent of silicon.

4,885,221

ELECTROPHOTOGRAPHY APPARATUS AND ELECTROPHTOGRAPHIC PROCESS FOR DEVELOPING POSITIVE IMAGE FROM POSITIVE OR NEGATIVE FILM

Kenichi Tsuneeda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 24, 1987, Ser. No. 100,756
Claims priority, application Japan, Dec. 6, 1986, 61-290805; Dec. 6, 1986, 61-290806
Int. Cl.[4] G03G 15/01
U.S. Cl. 430—100 14 Claims

14. A method for forming a positive image from a positive or a negative original image, comprising the steps of:
designating a type, positive or negative, of an original image;
uniformly charging a movable image carried to a first potential of a first polarity;

forming a first latent image on said movable image carrier when the positive image is formed from the negative original image, said first latent image is formed from the negative original image, said first latent image having first portion of a first potential and a second portion of a second potential different from that of the first potential in accordance with the original image;

developing an electrostatic latent image of the negative original image by using one of a first and a second developing agent applying with a second potential of the first polarity, which is lower than the first potential of the first polarity;

forming a second latent image on said movable image carrier, when the positive image is formed from the positive original image:

developing an electrostatic latent image of the positive original image and applying with a third potential of the first polarity, which is lower than the second potential of the first polarity;

transferring an image developed on said movable image carried onto a recording medium by applying a transferring potential of polarity which is determined in accordance with the polarity of the developing agent carried on said movable image carrier; and

uniformly charging the movable image carrier to a given potential lower than the first potential given by said charging means;

wherein said charging, first exposing, first developing, second exposing, second developing, transferring and discharging steps are performed in the order mentioned along a moving direction of said movable image carrier;

said method further comprises the steps of controlling said plurality of electrophotographic processing steps so that, when said positive original image is designated, said first exposing step is not performed and said second exposing step is performed to form the electrostatic latent corresponding to the positive original image on said movable image carrier, said first developing step is not performed and said second developing step is performed, and said transferring step is performed to transfer developing agent of the opposite polarity carried on the movable image carrier onto the recording medium,

whereby the opposite polarity of a residual developing agent not transferred onto the recording medium by said transferring step is changed to the first polarity at said charging step and is collected at said first developing step, and so that, when said negative original image is designated, said first exposing step is performed to form the electrostatic latent image corresponding to the negative original image on said movable image carrier, said first developing is driven, and said transferring steps is performed to transfer the first developing agent carrier ont he movable image carrier onto the recording medium, whereby a residual developing agent not transferred onto the recording medium is collected at said first developing step.

4,885,222

METHOD FOR DEVELOPING ELECTROSTATIC LATENT IMAGE IN AN OSCILLATING ELECTRIC FIELD

Tadashi Kaneko; Meizo Shirose, and Yoko Yamamoto, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,298

Claims priority, application Japan, Jul. 21, 1987, 62-180127

Int. Cl.[4] G03G *13/09*

U.S. Cl. 430—102 **10 Claims**

1. A method for developing an electrostatic image, said method comprising,

supplying a developer containing a carrier and a toner, said toner consisting of fine toner particles of which not less than 95 percent by weight have a particle size of from 1/1.7 to 1.7 times that of the weight average size of the toner particles, to the outer circumference of a cylinder-shaped sleeve member of a developer transporting means which comprises said sleeve member and a plurality of magnets provided inside said sleeve member, the magnetic poles and said sleeve member being so arranged as to be rotatable in relation to each other, around the center axis of said sleeve member,

forming a thin layer of said developer on the surface of said sleeve member by the use of a layer thickness regulating member, said layer thickness regulating member being disposed opposite to said developer transporting means and comprising a resilient plate, at least a part of said

resilient plate being in pressure contact with said sleeve member, the thickness of the developer layer being less than the minimum distance between the surface of said sleeve member and the surface of an electrostatic latent image carrying member,

carrying said developer in close proximity to the image carrying member, an oscillating electric field being applied between said electrostatic image carrying member and said developer transporting means, and

forming a toner image on said electrostatic latent image carrying member.

4,885,223

METHOD AND APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

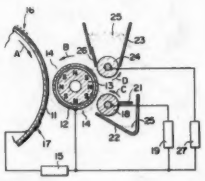
Shigekazu Enoki, Kawasaki; Noboru Sawayama, Tokyo; Shunji Katoh, Sagamihara, and Noriyuki Kimura, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 20, 1987, Ser. No. 16,739

Claims priority, application Japan, Feb. 20, 1986, 61-035544; Apr. 18, 1986, 61-090686; May 6, 1986, 61-103473; May 14, 1986, 61-110249; May 14, 1986, 61-110250; Jul. 18, 1986, 61-169318; Aug. 13, 1986, 61-189932; Aug. 13, 1986, 61-189933; Oct. 20, 1986, 61-249298

Int. Cl.[4] G03G *15/08, 15/09;* **B05C** *11/10*

U.S. Cl. 430—122 **21 Claims**



1. A method of developing an electrostatic latent image, comprising the steps of:

preliminary charging a toner;

supplying the preliminary charged toner to resilient devel-

oping brush means held in resilient contact with a latent image carrier while electrically charging the toner in a toner supplying region;

transferring the preliminary charged toner on said resilient developing brush means to an image developing region;

developing an electrostatic latent image formed on said image carrier with the toner by bringing said resilient developing brush means into contact with said latent image carrier in said image developing region;

transferring said resilient developing brush means from said image developing region to a toner recovering region separate from said toner supplying region after the image has been developed;

recovering residual toner from said resilient developing brush means in said toner recovering region in order to remove toner density irregularities from said resilient developing brush means; and

thereafter, transferring said resilient developing brush means again to said toner supplying region for successive image development.

5. An apparatus for developing an electrostatic latent image, comprising:

means for preliminary charging a toner;

means for supplying the preliminary charged toner to resilient developing brush means held in resilient contact with a latent image carrier while electrically charging the toner in a toner supplying region;

means for transferring the preliminary charged toner on said resilient developing brush means to an image developing region;

means for developing an electrostatic latent image formed on said image carrier with the toner by bringing said resilient developing brush means into contact with said latent image carrier in said image developing region;

means for transferring said resilient developing brush means from said image developing region to a toner recovering region separate from said toner supplying region after the image has been developed;

means for recovering residual toner from said . resilient developing brush means in said toner recovering region in order to remove toner density irregularities from said resilient developing brush means; and

means for again transferring said resilient developing brush means to said toner supplying region for successive image development.

4,885,224

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT, POLYMERIZABLE COMPOUND AND A DECOLORIZABLE DYE

Soichiro Yamamoto, and Ken Kawata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 14, 1987, Ser. No. 108,349

Claims priority, application Japan, Oct. 14, 1986, 61-243551

Int. Cl.[4] G03C *1/72, 1/84*

U.S. Cl. 430—138 **10 Claims**

1. A light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent, an ethylenically unsaturated polymerizable compound and a color image forming substance provided on a support, said silver halide, polymerizable compound and color image forming substance being contained in microcapsules having a shell which are dispersed in the light-sensitive layer, wherein the microcapsules comprise at least three kinds of microcapsules (I), (II) and (III), the microcapsules (I) containing a blue sensitive silver halide, an ethylenically unsaturated polymerizable compound and a color image forming substance, the microcapsules (II) containing a green sensitive silver halide, an ethylenically unsaturated polymerizable compound and a color image forming substance and a yellow dye having a property of being decolorized when it is heated or irradiated with light, and the microcapsules (III) containing a red sensitive silver halide, an ethylenically unsaturated polymerizable compound, a color image forming substance and a yellow dye having a property of being decolorized when it is heated or irradiated with light, and said yellow dye being different from the color image forming substance.

4,885,225

COLOR PROOF WITH NON-BLOCKING THERMAL ADHESIVE LAYER WITH PARTICULATE POLYMER BEADS

Michael B. Heller, Inver Grove Heights; Leonard W. Sachi, Oakdale, and David R. Walbridge, White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 29, 1988, Ser. No. 187,829

Int. Cl.[4] G03C *1/60, 7/00*

U.S. Cl. 430—160 **18 Claims**

1. A presensitized color-proofing sheet comprising a carrier sheet having a release surface, a continuous color coating of pigmented organophilic hydrophobic water-insoluble resinous polymer softenable and/or partially dissolvable in a solvent developing medium, said color coating being in intimate clinging engagement with but not adhesively bonded to said release surface, a light sensitive diazo resin soluble in said solvent developing medium directly associated with said color coating, said direct association being at least one of the following:

(a) the incorporation of said diazo resin in the color coating to form a single layer; and

(b) the incorporation of said diazo resin in a layer separate from but contiguous to the color coating layer,

a continuous, water-insoluble, transparent, colorless barrier layer bonded on one surface over said color coating and said diazo resin, said barrier layer being insoluble in said solvent developing medium, the diazo resin becoming insolubilized, and firmly bonding said color layer to said barrier layer in the light-struck areas upon light exposure of said sheet, the color layer and diazo resin being readily removable from said barrier layer in areas not light exposed and over said barrier layer a thermally-laminable adhesive layer comprising a layer of at least one acrylic polymer or copolymer which is laminable at a temperature between 100° and 150° C. at a pressure of 0.29 kg/sq. cm in 10 seconds, non-tacky at room temperature, will not discolor or alter the reflectance optical density by as much as 0.05 optical density units when exposed to sufficient ultraviolet radiation having a majority of the radiation distributed over the range of 350 and 450 nm to enable an image to be developed from activation of the diazo resin and have no ingredients capable of migrating through said barrier layer and desensitizing said diazo resin, discoloring said pigment, or distorting the optical properties of the other layers and containing narrow size distribution particulate organic polymer beads whose mean diameter is from 1.1 to 3 times the thickness of the said adhesive layer in a weight concentration range of 0.05 to 2% of the weight of adhesive.

4,885,226

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE SENSOR

Masaru Takeuchi, Uji; Kazuyuki Gotoh; Kenichiro Wakisaka, both of Hirakata; Kazuhiko Honma, Osaka; Takeo Fukatsu, Uji; Shoichi Nakano, Hirakata, and Yukinori Kuwano, Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation of Ser. No. 2,954, Jan. 13, 1987, abandoned. This application Sep. 29, 1988, Ser. No. 251,944

Claims priority, application Japan, Jan. 18, 1986, 61-8526; Sep. 5, 1986, 61-210036; Sep. 20, 1986, 61-222321

Int. Cl.[4] G03G *5/14*

U.S. Cl. 430—65 **7 Claims**

1. An electrophotographic photosensitive sensor, comprising a conductive substrate; a blocking layer formed on said substrate, said blocking layer including a multilayer comprising a first group of one or more constituent thin layers made of amorphous silicon, said first group of thin layers having rela-

tively large energy band gaps sufficient for effectively blocking minority charge carriers coming from said substrate, and a second group of one or more constituent thin layers made of a material selected from the group consisting of microcrystalline silicon, microcrystalline silicon-germanium alloy, and amorphous silicon-germanium alloy, said second group of thin layers having relatively small energy band gaps of less than 1.7eV for effectively absorbing light of a wavelength longer than 750nm and for reducing reflections of light incident on the surface of said substrate; a photoconductive layer formed on said blocking layer and made mainly of amorphous or microcrystalline silicon and/or germanium; and a surface layer formed on said photoconductive layer and made mainly of amorphous or microcrystalline silicon and/or germanium.

4,885,227

IMAGE-RECEIVING MATERIAL AND IMAGE-FORMING METHOD EMPLOYING THE SAME

Taku Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 7, 1988, Ser. No. 165,060

Claims priority, application Japan, Mar. 6, 1987, 62-51619

Int. Cl.[4] G03C *5/54, 1/68;* G03F *7/26*

U.S. Cl. 430—254 **13 Claims**

1. An image-forming method which comprises: imagewise exposing to light a light-sensitive material comprising a support and a light-sensitive layer containing silver halide, a reducing agent and a polymerizable compound;

simultaneously or thereafter developing the light-sensitive material;

pressing the light-sensitive material on an image-receiving material comprising a support and an image-receiving layer to transfer the unpolymerized polymerizable compound to the image-receiving layer of the image-receiving material,

wherein the image-receiving layer contains a hardening agent being capable of polymerizing the polymerizable compound without necessity of external energy.

12. The image-forming method as claimed in claim 1, wherein the development is done by a heat development process.

4,885,228

OPTICAL INFORMATION RECORDING MEDIUM

Yoshio Inagaki; Keiichi Adachi, and Yoshiaki Suzuki, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

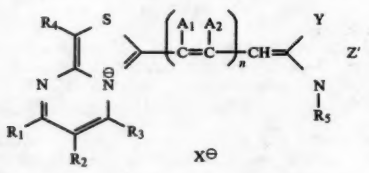
Filed Jul. 28, 1987, Ser. No. 78,844

Claims priority, application Japan, Jul. 29, 1986, 61-178504; Oct. 20, 1986, 61-248976

Int. Cl.[4] G11B *7/24;* G01D *9/00;* G03C *5/16;* B41M *5/26*

U.S. Cl. 430—270 **34 Claims**

1. An optical information recording medium being adapted to have information recorded thereon or read by a laser beam, comprising a recording layer on at least one side of a substrate, the recording layer containing at least one of the compounds represented by the following general formula (I):



(I)

wherein:

A_1 and A_2 independently represent a hydrogen atom or a substituent;

Z represents an atomic group necessary for forming a five-membered heterocycle;

R_1 to R_4 independently represent a hydrogen atom or a substituent;

R_5 represents a substituent or may form a six-membered heterocycle together with Z;

n represents 0, 1 or 2; and

$X\ominus$ represents an anion.

4,885,229

PHOTOPOLYMERIZABLE COMPOSITIONS

Fumio Takenaka; Kouzi Tohya, and Yoshihiro Ohtsuka, all of Amagasaki, Japan, assignors to 501 Daicel Chemical Industries Ltd., Osaka, Japan

Filed Dec. 22, 1987, Ser. No. 136,709

Int. Cl.[4] G03C *1/68*

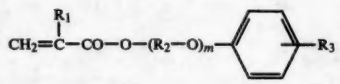
U.S. Cl. 430—285 **11 Claims**

1. A photopolymerizable composition comprising:

(1) a thermoplastic high molecular weight binder obtained by copolymerizing:

(i) 4 to 40 wt. % of an addition polymerizable monomer (A) containing the carboxyl group;

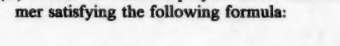
(ii) at least 5 wt. % of an addition polymerizable non-acidic monomer (B) represented by the general formula:



(I)

wherein R_1 is a hydrogen atom or methyl group; R_2 is an alkylene group having 1 to 5 carbon atoms: R_3 is a hydrogen atom, a halogen atom or an alkyl group having 1 to 5 carbon atoms; and m is an integer of 1 to 20; and

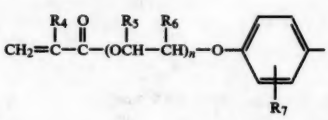
(iii) at least an addition polymerizable non-acidic monomer satisfying the following formula:



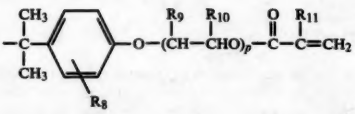
(II)

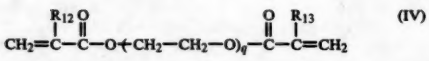
wherein Q and e are stability and polar values, respectively, as defined by the Alfrey-Price equation, and the symbols A and C correspond to the addition polymerizable monomer (A) and to the addition polymerizable non-acidic monomer (C), respectively;

(2) an acrylate or methacrylate ester derivative selected from the compounds of formulae (III), (IV) and (V):



(III)



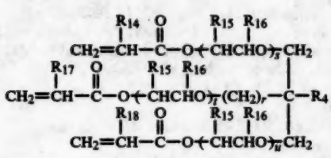


(IV)

wherein R_4, R_5, R_6, R_9, R_{10} and R_{11} are the same or different and each is a hydrogen atom or methyl group; R_7 and R_8 are the same or different, and each is a hydro-

gen atom or a halogen atom; and n and p each is a positive integer satisfying n+p=2 to 20;

wherein R_{12} and R_{13} are the same or different and each is a hydrogen atom or methyl group; and q is an integer of 4 to 13;



(V)

wherein R_{14} is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, or an aryl group; R_{15} and R_{16} are each a hydrogen atom or a methyl group, provided that at least one is a methyl group; R_{17} and R_{18} are the same or different, and each is a hydrogen atom or a methyl group; r is 0, 1, 2 or 3; and s, t and w are each a positive integer satisfying s+t+u=3 to 30;

or a mixture of two or more of said acrylate or methacrylate ester derivatives; and

(3) a photopolymerization initiator.

4,885,230

BURN-IN GUMMING COMPOSITION FOR OFFSET PRINTING PLATES

Paul Stahlhofen, Wiesbaden, and Dieter Mohr, Schlangenbad, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 928,392, Nov. 10, 1982, abandoned. This application Sep. 6, 1988, Ser. No. 241,790

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1985, 3539992

Int. Cl.[4] G03C *1/52*

U.S. Cl. 430—309 **4 Claims**

1. A method for burning-in irradiated and developed offset printing plates, comprising the steps of:

(a) coating at least one surface of an irradiated and developed offset printing plate with a burn-in gumming composition comprising an aqueous solution comprising water and from about 1 to 50% by weight of a water-soluble polymer or copolymer, wherein the polymer or copolymer comprises monomers selected from the group consisting of styrenesulfonic acid, methylstyrenesulfonic acid, vinylsulfonic acid, acrylamidopropanesulfonic acid, vinyl acetate, and the water-soluble salts thereof; and then

(b) heating said printing plate for a sufficient time to effect burning-in.

4,885,231

PHASE-SHIFTED GRATINGS BY SELECTIVE IMAGE REVERSAL OF PHOTORESIST

Winston K. Chan, Fair Haven, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed May 6, 1988, Ser. No. 191,186

Int. Cl.[4] G03C *5/16*

U.S. Cl. 430—321 **11 Claims**

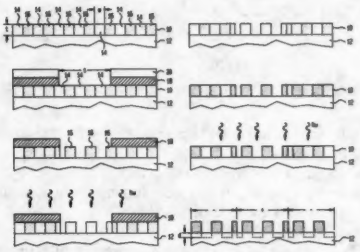
1. A device fabrication method comprising the steps of

forming exposed and unexposed regions in a layer of positive photoresist supported on a substrate;

forming a mask to cover a first portion of said layer of photoresist and to leave uncovered a second portion of said layer of photoresist;

processing the exposed and unexposed regions of said layer of photoresist to cause the unexposed regions in said second portion to be insoluble in developer and to cause the exposed regions in said first portion to be insoluble in developer;

and developing the processed regions in said first and second portions to form a photoresist pattern having negative and



positive images in said first and second portions, respectively, of said layer of positive photoresist.

4,885,232

HIGH TEMPERATURE POST EXPOSURE BAKING TREATMENT FOR POSITIVE PHOTORESIST COMPOSITIONS

Mark A. Spak, Edison, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 710,561, Mar. 11, 1985, abandoned. This application Oct. 17, 1986, Ser. No. 921,879

Int. Cl.[4] G03F *7/26*

U.S. Cl. 430—326 **15 Claims**

1. A method for producing a photographic element which consists essentially of coating a substrate with a positive working photosensitive composition which composition comprises an aqueous alkali soluble resin, a quinone diazide photosensitizer and a solvent composition, then heat treating said coated substrate at a temperature of from about 20° C. to about 100° C. until substantially all of said solvent composition is removed; then imagewise exposing said photosensitive composition to actinic radiation; then baking said coated substrate at a temperature of from at least about 130° C. to about 155° C. for from about 15 seconds to about 90 seconds; and the removing the exposed non-image areas of said composition with a developer until substantially all of the coating has dissolved from the exposed areas, which developer consists essentially of an aqueous alkaline solution to attain an image having thermal stability at least equal to the temperature of said baking step.

4,885,233

MERCURY AND BENZOTHIAZOLIUM SALT STABILIZATION OF A PHOTOGRAPHIC RECORDING MATERIAL

Calvin R. Messing, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,497

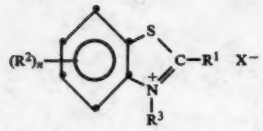
Int. Cl.[4] G03C *1/34*

U.S. Cl. 430—608 **13 Claims**

1. A photographic recording material comprising a support having thereon a radiation sensitive silver halide emulsion layer and an effective amount of a fog inhibiting combination of

(a) a compound which is an oxide or a salt of mercury, and

(b) a benzothiazolium compound having the structural formula:



wherein:

R^1 is hydrogen or an alkyl group having from 1 to about 4 carbon atoms;

R^2 is an electron withdrawing group;

R^3 is hydrogen, an alkyl group having from 1 to about 4 carbon atoms or benzyl;

X is an anion;

n is 0 or from 1 to 3; wherein at least one of R^1 and R^3 is substitute d with a halogen atom, hydroxy, mercapto or alkoxy comprising from 1 to about 4 carbon atoms.

4,885,234

PHOTOGRAPHIC MATERIALS CONTAINING STABLE CYAN COUPLER FORMULATIONS

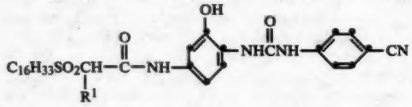
Paul L. Zengerle, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1988, Ser. No. 251,533

Int. Cl.[4] G03C *7/34*

U.S. Cl. 430—546 **18 Claims**

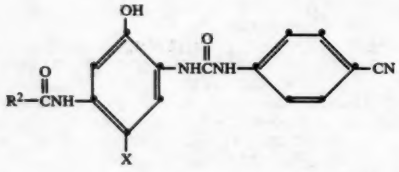
1. A photographic recording material comprising a support and a photosensitive silver halide emulsion which has associated therewith (1) a cyan dye-forming coupler component comprising (a) from about 20 to 100% by weight of a sulfone group containing coupler compound having the structural formula:



(I)

wherein:

R^1 is alkyl having 2 or 3 carbon atoms; and (b) up to about 80% by weight of a coupler compound having the structural formula:



(II)

wherein:

R^2 is a ballast group; and

X is hydrogen or a coupling-off group, said coupler component being dispersed in (2) a coupler solvent component which comprises (c) from 1 to about 50% by weight of N,N-diethyllauramide and (d) from about 50 to about 99% by weight of a dialkyl phthalate compound.

4,885,235

METHOD FOR RAPID AND SENSITIVE DETECTION OF HIV-1 ANTIBODIES

Kurt B. Osther, Dallas, and Louis M. Dyll, Rockwall, both of Tex., assignors to 501 Bio-Research Laboratories, Inc., Southport, Conn.

Filed Sep. 21, 1987, Ser. No. 99,311

Claims priority, application Denmark, Jul. 6, 1987, 3622/87

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[4] G01N *33/569*

U.S. Cl. 435—5 **16 Claims**

1. In a method for the detection of antibodies to HIV-I retrovirus, comprising:

(a) contacting nitrocellulose paper containing blotter resolved HIV-I antigen protein obtained from gel electrophoretically resolved HIV-I viral lysate with a test sample diluted with a buffer, and incubating the nitrocellulose paper and test sample to permit binding of antibodies present in the sample to the protein on the nitrocellulose paper;

(b) contacting the incubated nitrocellulose paper of step (a) with an enzyme conjugated antiserum reactive with said antibodies, and incubating to permit binding of the antiserum to said antibodies;

(c) contacting the incubated nitrocellulose paper of step (b) with an enzyme substrate specific for the enzyme of step (b), and incubating to thereby produce color;

(d) stopping the color producing reaction of step (c); and

(e) evaluating the amount of color produced as an indication of the presence of antibodies to HIV-I viral lysate;

the improvement wherein

(1) the viral lysate is electrotransferred to the nitrocellulose paper in a concentration at least 20%, but less than 40%, greater than the 50–100 ug of HIV-I antigen protein per 10×16 cm electrophoresis gel utilized in the Western Blot assay;

(2) the resolved HIV-I antigen protein is incubated in step (a) in the presence of milk protein; and

(3) the test sample is diluted in buffer to a serum concentration at least 3, but less than 7, times greater than the 1:100 dilution of the test sample utilized in the Western Blot assay,

to complete the assay within 60 minutes.

4,885,236

METHOD FOR DETERMINING TISSUE OF ORIGIN AND PRESENCE AND EXTENT OF CELLULAR ABNORMALITIES

Sheldon Penman, Brookline, and Edward G. Fey, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 812,955, Dec. 24, 1985. This application Dec. 23, 1986, Ser. No. 946,770

The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.

Int. Cl.[4] C12Q *1/68, 1/02;* G01N *33/53;* C07G *15/00*

U.S. Cl. 435—6 **21 Claims**

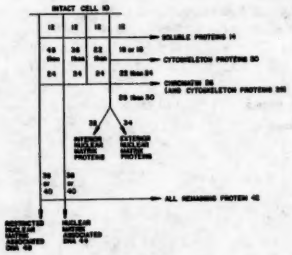
1. A method for characterizing the origin and malignancy of cellular materials comprising:

(a) isolating interior nuclear matrix proteins from at least one type of cell of known origin;

(b) separating the isolated interior nuclear matrix proteins;

(c) comparing isolated and separated interior nuclear matrix

proteins from cells of unknown origin with the separated interior nuclear matrix proteins of known origin; and



(d) characterizing interior nuclear matrix proteins from cells of unknown origin based upon the comparison with interior nuclear matrix proteins from cells of known origin.

4,885,237

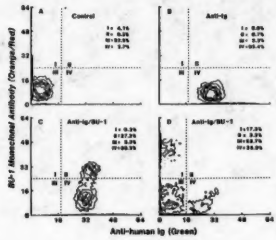
DETECTION OF CELLULAR DNA

Elizabeth L. Evans, Saratoga, Calif.; Nick J. Gonchoroff; Philip R. Greipp, both of Rochester, Minn.; David W. Houck, Mountain View, Calif.; Jerry A. Katzmann; Robert A. Kyle, both of Rochester, Minn., and Michael R. Loken, Los Altos, Calif., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 798,506, Nov. 15, 1985, abandoned. This application Jun. 6, 1988, Ser. No. 205,013

Int. Cl.[4] C12Q *1/68;* G01N *33/00*

U.S. Cl. 435—6 **35 Claims**



9. A method for simultaneous detection of a cellular antigen and double-stranded DNA synthesized within a cell comprising the steps of providing a sample of viable cells, exposing said viable cells to halodu so as to provide synthesized, double-stranded DNA having a halodu incorporated therein, wherein halodu is selected from the group consisting of BrdU, IdU and CldU, then exposing said cells to a first monoclonal antibody which has specificity to said cellular antigen, then treating the cells with a fixative that will partially disrupt the plasma membrane to allow passage of anti-halodu monoclonal antibodies to the cell nucleus without disrupting the cellular antigens which have been tagged by the first monoclonal antibody, then exposing the DNA within the cell to an enzyme, wherein said enzyme will partially disrupt the hydrogen bonds between the double-stranded DNA, then exposing the enzyme treated DNA to an anti-halodu monoclonal antibody and thereafter detecting the cellular antigen bound to first monoclonal antibody and halodu bound to said anti-halodu monoclonal antibody.

4,885,238

IMMORTALIZED HUMAN BRONCHIAL EPITHERIAL MESOTHELIAL CELL LINES

Roger R. Reddel, Kensington; Ke Yang; Johng S. Rhim, both of Bethesda, all of Md.; Douglas Brash, Washington, D.C.; Robert T. Su, Lawrence, Kans.; John F. Lechner, Kensington, Md.; Brenda I. Gerwin; Curtis C. Harris, both of Bethesda, Md., and Paul Amstad, Epolinges, Switzerland, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 30, 1987, Ser. No. 114,508

Int. Cl.[4] C12Q *1/18, 1/02, 1/68;* C12N *15/00*

U.S. Cl. 435—29 **12 Claims**

1. Non-tumorigenic, human bronchial epithelial or mesothelial cell line or derivative thereof growing without senescence when cultured in vitro in growth medium, said cell lines being selected from the group consisting of those having the identifying characteristics of ATCC CRL 9608, 9609, 9442, 9443, 9444, 9482 and 9483.

4,885,239

RAPID DIFFERENTIATION OF BACTERIA USING POLYETHER ANTIBIOTICS

Peggy W. Cichanowicz, Pittsford, and Robert T. Belly, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 24, 1986, Ser. No. 910,917

Int. Cl.[4] C12Q *1/04*

U.S. Cl. 435—34 **20 Claims**

1. A composition for differentiating between viable gram-positive and gram-negative bacteria comprising:

(a) a dye or dye precursor capable of being reduced to provide a detectable species by both viable gram-positive and gram-negative bacteria, and

(b) a polyether antibiotic present in an amount sufficient to selectively and substantially inhibit the reduction of said reducible dye or dye precursor by said gram-positive bacteria.

4,885,240

USE OF ORGANIC BUFFERS TO REDUCE DEHYDROASCORBIC ACID INTERFERENCE IN ANALYTICAL METHODS

Annie L. Wu, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 4, 1986, Ser. No. 903,532

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[4] C12Q *1/04*

U.S. Cl. 435—34 **18 Claims**

12. A method for the reduction of interference by dehydroascorbic acid in a determination of an analyte which is substantially unaffected by the presence of dehydroascorbic acid comprising the steps of:

A. contacting a sample of a liquid suspected of containing an analyte and dehydroascorbic acid with

(a) a dye or dye-providing compound capable of being reduced to provide a detectable species by said analyte and dehydroascorbic acid, and

(b) a nitrogen-containing organic buffer which buffers said liquid sample at physiological pH, and

B. determining said detectable species resulting from the presence of said analyte,

said dye or dye-providing compound represented by the structure $CAR—R^1)_n$ wherein CAR- is a carbocyclic aromatic or quinone nucleus, R^1 is

$$+R^5)_m N—Q—FRAG,$$

wherein R^5 is alkylene of 1 or 2 carbon atoms, R^6 is alkyl,

cycloalkyl or carbocyclic aryl, Q is carbonyl or thiocarbonyl. FRAG is a moiety which provides a detectable chromogen or fluorogen when released from said reducible dye or dye-providing compound upon reduction by said analyte or dehydroascorbic acid, m is 0 or 1, and n is 1 or 2,

provided said reducible dye or dye-providing compound is capable of being reduced at physiological pH to release said chromogen or fluorogen, and

further provided that when R^1 is replaced with H, CA-R—H)$_n$ has an $E_{\frac{1}{2}}$ of either at least about +100 mV when measured in water, or of at least about −650 mV when measured in acetonitrile.

4,885,241

ETHANOL PRODUCTION BY ZYMOMONAS CULTURED IN YEAST-CONDITIONED MEDIA

Robyn J. Millichip, Lincoln, Nebr., assignor to University of Queensland, Queensland, Australia

Filed Oct. 13, 1988, Ser. No. 257,073

Int. Cl.[4] C12R *1/38*; C12P *39/00, 7/06, 7/14*

U.S. Cl. 435—42 **6 Claims**

1. A process for converting a fermentable carbohydrate to ethanol comprising:

(a) providing a culture medium containing a fermentable carbohydrate and yeast in the fermenting phase containing carbohydrate substrate fermentable by Zymomonas, wherein said culture medium does not contain any anti-Zymomonas agents;

(b) adding Zymomonas to said yeast containing culture medium; and

(c) culturing the yeast-Zymomonas under anaerobic conditions at a pH of greater than about 4 to promote growth of the Zymomonas and not the yeast.

4,885,242

GENES FROM PICHIA HISTIDINE PATHWAY AND USES THEREOF

James M. Cregg, San Diego, Calif., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1984, Ser. No. 666,578

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[4] C12P *21/00, 21/02*; C12N *15/00, 5/00*

U.S. Cl. 435—68 **24 Claims**

1. A method for the isolation of functional genes from yeast strains of the genus Pichia by complementation comprising:

(a) preparing a library by treating Pichia total DNA with an appropriate restriction enzyme to give Pichia DNA fragments and cloning said DNA fragments into a *Saccharomyces cerevisiae—Escherichia coli* shuttle vector;

(b) transforming with said library a mutant *Saccharomyces cerevisiae* host strain which has a selectable phenotype as a result of a defect in at least one gene product;

(c) growing the transformed strains under selective growth conditions; wherein said selective growth conditions do not provide the conditions required by the defective host strain for growth and wherein the transformant selected for comprises a plasmid which contains a Pichia gene which complements the *Saccharomyces cerevisiae* gene defect;

(d) isolating plasmid DNA from said selected transformed strains; and

(e) recovering Pichia functional gene DNA inserts from said plasmid DNA.

4,885,243

PROCESS FOR PRODUCING A-21978C DERIVATIVES

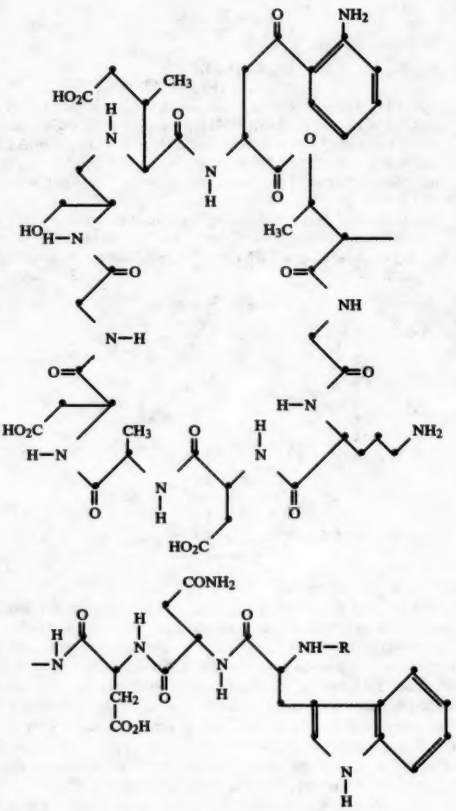
Floyd M. Huber, Danville; Richard L. Pieper, Indianapolis, and Anthony J. Tietz, Plainfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 658,979, Oct. 9, 1984, abandoned. This application Sep. 9, 1985, Ser. No. 773,762

Int. Cl.[4] C12P *21/04*; C12R *1/465*; C07K *1/00*

U.S. Cl. 435—71.3 **11 Claims**

1. In the process for producing an A-21978C derivative of the formula



wherein R is a C_2–C_{14}-alkanoyl group, the improvement which comprises feeding the corresponding ROH acid, or an ester or salt thereof, to an A-21978C-producing *Streptomyces roseosporus* culture selected from NRRL 11379, NRRL 15998, or an A-21978C-producing mutant thereof, during the production stage of the fermentation until the A-21978C derivative is produced.

4,885,244

METHOD OF PRODUCING HYALURONIC ACID

Takao Miyamori; Ryozo Numazawa; Akihiro Sakimae, and Hisao Onishi, Tokyo, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1987, Ser. No. 104,219
Claims priority, application Japan, Oct. 9, 1986, 61-240904; Dec. 16, 1986, 61-299191; May 6, 1987, 62-110157
Int. Cl.[4] C12P *19/04;* C07H *5/04*
U.S. Cl. 435—101 3 Claims

1. In a method for producing hyaluronic acid comprising contacting a hyaluronic acid-producing microorganism with a saccharide in a medium, the improvement which comprises:

adding to said medium at least one compound selected from the group consisting of phenol, cresol, xylenol, catechol, 4, methyl-pyrocatechol, urushiol, cresolcinol, orcinol, pyrogallol, 1, 2, 4-benzenetriol, benzenetetraol, benzenehexaol, getisinic acid, 2, 3-dihydroxybenzoic acid, gallic acid, salicylic acid, protocatechuic acid, pyrogallol-4-carboxylic acid, 3-o-galloylgallic acid, vanillin, o-vanillin, protocatechualdehyde, catechin, luteolin, myricetin, anthocyanidin, biphenyldiol, ellagic acid, naphthol, naphthalenediol, chrysarobin, anthragallol, sulfosalicylic acid, vitamin P, 3, 4-dihydroxyphenylalanine and tannins, in an amount of from 0.0001% by weight up to an amount such that the amount of hyaluronic acid produced in the presence of said compound is less than the amount of hyaluronic acid produced in the absence of said compound.

4,885,245

PROCESS FOR PRODUCING L-TRYPTOPHAN

Masaaki Ishida, Kawasaki; Kiyoshi Miwa, Matsudo; Shigeru Nakamori, Yokohama, and Konosuke Sano, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jul. 31, 1985, Ser. No. 760,930
Claims priority, application Japan, Jul. 31, 1984, 59-161217
Int. Cl.[4] C12N *15/00*
U.S. Cl. 435—108 9 Claims

1. A process for producing L-tryptophan, which comprises:

contacting in a medium a Coryneform bacterium capable of producing L-tryptophan, wherein said bacterium is Brevibacterium lactofermentum FERM BP-846 or Corynebacterium glutamicum FERM BP-845m with raw material capable of being enzymatically converted into L-tryptophan, wherein said bacterium contains recombinant DNA constructed by connecting a feedback resistant gene coding for tryptophan synthase in a mutant strain of B. lactofermentum with a plasmid vector capable of proliferating in said Coryneform bacterium,

allowing L-tryptophan to accumulate in said medium, and isolating L-tryptophan.

4,885,246

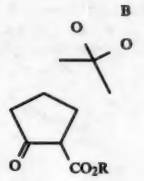
OPTICALLY ACTIVE CARBACYCLIN INTERMEDIATES AND PROCESSES FOR THE PREPARATION THEREOF

Kenji Mori, Tokyo, and Masahiro Tsuji, Kawagoe, both of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Division of Ser. No. 868,672, May 30, 1986. This application Dec. 19, 1988, Ser. No. 286,159
Claims priority, application Japan, Jun. 4, 1985, 60-119807
Int. Cl.[4] C07D *317/72;* C12P *17/02, 41/00;* A61K *31/55*
U.S. Cl. 435—123 6 Claims

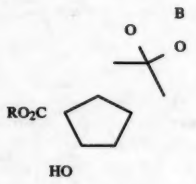
1. A process for preparing a compound of formula (I)

(I)



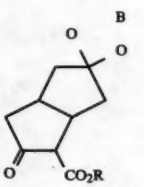
wherein R represents lower alkyl and B represents an alkylene group optionally substituted with alkyl, and a compound of formula (III)

(III)



wherein R and B have the meanings given above, said process comprising treating a (1SR,5RS)-7,7-alkylenedioxy-2-alkoxycarbonyl-cis-bicyclo[3.3.0]octan-3-one, which is a racemic compound of formula (II)

(II)



wherein R and B have the meanings given above, with a microorganism having an ability of specifically reducing the keto group of the (1R,5S) epimer of the racemic compound (II), thereby giving, as a nonreduced compound, an optically active (1S,5R)-7,7-alylenedioxy-2-alkoxy-carbonyl-bicyclo[3.3.0]octan-3-one of said formula (I) and, as a reduced compound, an optically active (1S,5R,6R,7S)-3,3-alkylenedioxy-7-hydroxy-6-alkoxycarbonylbicyclo [3.3.0] octane of said formula (III), wherein R ad B have the meanings given above.

4,885,247

RECOVERY AND PURIFICATION OF LACTATE SALTS FROM WHOLE FERMENTATION BROTH BY ELECTRODIALYSIS

Rathin Datta, Chicago, Ill., assignor to Michigan Biotechnology Institute, East Lansing, Mich.

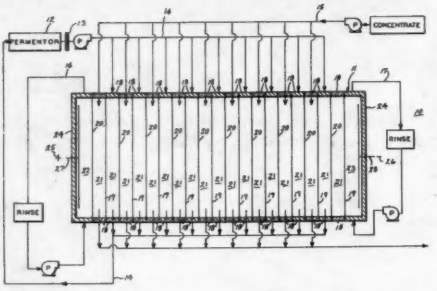
Filed Apr. 19, 1988, Ser. No. 183,061
Int. Cl.[4] C12P *7/56*
U.S. Cl. 435—139 10 Claims

1. A process for growing, recovering and purifying lactate from a whole fermentation broth which comprises:

(a) growing a microorganism having the identifying characteristics of *Lactobacillus acidophilus* IAM 3532 which is capable of producing at least 2 grams of lactate per liter of broth per hour in a fermentor on a carbohydrate containing substrate at a pH of about 5.0 to about 5.7 and a temperature of about 35° to about 45° C. until the broth con-

tains about 75 to about 90 grams of lactate per liter of broth;

(b) introducing the whole broth containing cells and lactate into an electrodialysis unit having an anode; a cathode; at least one compartment formed by spaced apart anionic-permeable and cationic-permeable membranes; and



(c) applying electrical current to said membranes to cause lactate anions in said broth in said compartment to permeate through the anionic permeable membrane and concentrate into an aqueous liquid on the other side of said membrane.

4,885,248

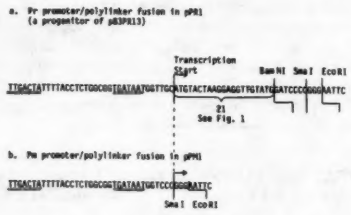
TRANSFER VECTOR

Paul G. Ahlquist, Madison, Wis., assignor to Lubrizol Genetics, Inc., Wickliffe, Ohio

Continuation-in-part of Ser. No. 580,445, Feb. 14, 1984, abandoned. This application Mar. 9, 1987, Ser. No. 12,739

Int. Cl.[4] C12N *15/00;* **C12R** *1/41, 1/185;* **C07H** *15/12*

U.S. Cl. 435—172.3 **24 Claims**



1. A recombinant DNA vector comprising

(a) a replication origin, a selectable marker and

(b) a nucleotide sequence comprising a promoter, a transcription initiation site of which has been modified by introducing a restriction endonuclease recognition sequence such that a cleavage site of said restriction endonuclease recognition sequence coincides with said transcription initiation site of said promoter and wherein said promoter does not naturally contain a restriction endonuclease sequence a cleavage site of which coincides with a transcription initiation site of said promoter.

4,885,249

ASPERGILLUS NIGER TRANSFORMATION SYSTEM

Franics P. Buxton, Toronto; David I. Gwynne, Brampton, and Roger W. Davies, Limehouse, all of Canada, assignors to Allelix, Inc., Mississauga, Canada

Filed Dec. 5, 1984, Ser. No. 678,578

Int. Cl.[4] C12N *15/00, 1/14;* **C12P** *21/00*

U.S. Cl. 435—172.3 **22 Claims**

1. A process for transforming *Aspergillus niger,* said process comprising the steps of:

treating an *Aspergillus niger* strain with recombinant DNA under conditions permitting at least some of said *Aspergillus niger* to take up said recombinant DNA and form transformants wherewith; and

selecting resulting *Aspergillus niger* transformants.

4,885,250

ENZYME IMMOBILIZATION AND BIOAFFINITY SEPARATIONS WITH PERFLUOROCARBON POLYMER-BASED SUPPORTS

John William d. Eveleigh, Hockessin, and Robert K. Kobos, Wilmington, both of Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1987, Ser. No. 20,808

Int. Cl.[4] C12N *11/06;* **G01N** *33/547;* **C07K** *17/06, 3/20*

U.S. Cl. 435—181 **23 Claims**

1. A solid support containing an attached ligand or binder for the ligand consisting essentially of:

(A) a chemically inert, water immiscible solid perfluorocarbon polymer carrier having low nonspecific binding to a ligand or binder for the ligand;

(B) a perfluorocarbon-substituted ligand or binder for the ligand securely but reversibly attached to the surface of said carrier; and

(C) a nonionic fluorosurfactant coating on said carrier.

4,885,251

RECOMBINANT DNA EXPRESSION VECTORS AND DNA COMPOUNDS WHICH ENCODE ISOPENICILLIN N SYNTHETASE

Thomas D. Ingolia; Stephen W. Queener; Suellen M. Samson, all of Indianapolis; Paul L. Skatrud, and Otis W. Godfrey, both of Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 799,384, Nov. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 725,870, Apr. 22, 1985, abandoned. This application Aug. 8, 1986, Ser. No. 895,008

Int. Cl.[4] C12N *9/00, 15/00;* **C12P** *1/02, 1/04*

U.S. Cl. 435—183 **65 Claims**

1. An isolated DNA compound that encodes isopenicillin N synthetase from Cephalosporium.

36. A method of producing isopenicillin N synthetase activity in a host cell that comprises:

(1) transforming said host cell with a recombinant DNA expression vector comprising a DNA compound of claim 1 positioned for expression from a transcriptional and translational activating sequence functional in said host cell; and

(2) culturing said host cell transformed in step (1) under conditions that allow for expression of said DNA.

4,885,252

RECOMBINANT DNA EXPRESSION VECTORS AND DNA COMPOUNDS THAT ENCODE ISOPENICILLIN N SYNTHETASE FROM *ASPERGILLUS NIDULANS*

Thomas D. Ingolia; Stephen W. Queener, both of Indianapolis; Paul L. Skatrud, Greenwood, and Barbara J. Wiegel, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 94,345, Sep. 8, 1987, abandoned. This application Dec. 14, 1987, Ser. No. 133,760

Int. Cl.[4] C12N *15/00, 1/20, 1/14;* C07H *15/12*

U.S. Cl. 435—252.3 20 Claims

1. An isolated DNA compound that comprises DNA that encodes isopenicillin N synthetase from Aspergillus.

4,885,253

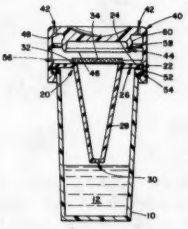
UNIVERSAL BIOLOGICAL INDICATOR SYSTEM

Raymond C. Kralovic, Austinburg, Ohio, assignor to Steris Corporation, Painesville, Ohio

Filed Mar. 27, 1989, Ser. No. 329,332

Int. Cl.[4] C12M *1/24*

U.S. Cl. 435—296 20 Claims



1. A biological indicator system comprising:

a capsule whose interior volume is less than half filled with a liquid culture medium and which has a vent, tube extending from its exterior to a vent aperture in the tube at a volumetric center of the capsule interior volume such that an upper surface of the culture medium is disposed below the vent aperture regardless of the orientation of the capsule;

a sealing means across the vent tube which permits gas to pass from the capsule interior volume to the exterior in the presence of steam and prevents communication with the capsule interior volume in the absence of steam;

an element inoculated with microorganisms mounted adjacent the capsule;

a cap movably mounted on the capsule surrounding the inoculated element for movement between at least first and second positions, the cap having apertures which provide a fluid flow path for both liquids and gas between the inoculated element and the exterior in the first position and which blocks the fluid flow path between the inoculated element and the exterior in the second position.

4,885,254

FLUORESCENE TECHNIQUE TO MONITOR CURE IN POLYMERS

Chong S. P. Sung, Lexington,, Mass., assignor to University of Connecticut, Storrs, Conn.

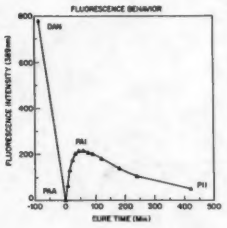
Continuation-in-part of Ser. No. 878,138, Jun. 25, 1986, Pat. No. 4,717,674, which is a continuation-in-part of Ser. No. 800,443, Nov. 21, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 132,567

Int. Cl.[4] G01N *33/44*

U.S. Cl. 436—85 19 Claims

6. A method for determining the extent of polymerization of a polymer system for producing a polymer cure product selected from the group consisting of polyimides, polyetherimides, polyurethanes and polyureas, said system including at least one precursor and a curing agent, comprising the steps of:

a. adding a label to the polymer system, said label reacting with the precursor at a rate comparable to the reaction rate of the curing agent with the precursor, said label being selected and added at a concentration producing a



fluorescence intensity proportional to the concentration of polymer cure products;

b. polymerizing the polymer system;

c. measuring the fluorescence of the polymerizing polymer system; and

d. comparing the measured fluorescence intensity to the extent of polymerization.

4,885,255

IMMUNOCHEMICAL PROCESS AND REAGENT FOR THE DETERMINATION OF A POLYVALENT ANTIGEN IN A LIQUID SAMPLE

Werner Stock, Grifelfing; Manfred Baier, Seeshaupt, both of Fed. Rep. of Germany; Klaus P. Kaspar, Asuncion, Paraguay, and Peter Kirch, Weilheim, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 173,779

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1987, 3714147

Int. Cl.[4] C01N *33/563, 33/053, 33/544, 33/541*

U.S. Cl. 436—512 21 Claims

1. Process for the quantitative determination of a polyvalent antigen comprising incubating a liquid sample containing said antigen with three different receptors, wherein the first receptor (R1) and the third receptor (R3) are in liquid phase and bind with the polyvalent antigen, and the second receptor (R2) is in solid phase and binds with (R1), wherein (R3) carries a label and does not cross react with (R1) and (R2) to form a solid phase complex of (R2), (R1), antigen and (R3), separating the solid phase from the liquid phase and measuring the label in one of the phases as an indication of said polyvalent antigen, wherein said first receptor either comprises an oligomer of at least two antibody molecules or consists of a oligomer of antibody fragments selected from the group consisting of Fab or $(Fab')_2$ fragments bound together which antibody molecules or antibody fragments all have specificity for the antigen to be determined.

4,885,256

MONOCLONAL ANTIBODIES TO CHOLESTEROL AND METHODS

Carl R. Alving, Washington, D.C., and Glenn M. Swartz, Jr., Laurel, Md., assignors to The United States of America as represented by the United States Army, Washington, D.C.

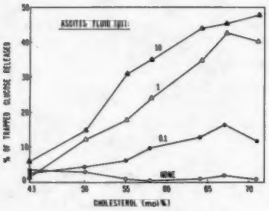
Filed Jun. 17, 1986, Ser. No. 875,048

Int. Cl.[4] C07K *15/14;* G01N *33/543, 33/577*

U.S. Cl. 436—518 11 Claims

7. A method for the detection of cholesterol in biological specimens which comprises the steps of (1) contacting the

biological specimens which may contain cholesterol with antibodies which demonstrate reactivity to cholesterol as evidenced by the ability to induce complement-dependent immune damage to high-cholesterol liposomes containing dimyristoyl phosphatidyl choline, cholesterol and dicetyl phosphate, but not to low-cholesterol liposomes containing dimyristoyl phosphatidyl choline, cholesterol and dicetyl phosphate, (2) measuring the formation of antigen-antibody complexes by immunosorbent assays and (3) relating the measurements of step (2) to the presence of or concentration of cholesterol in biological specimens.



4,885,257

GETTERING PROCESS WITH MULTI-STEP ANNEALING AND INERT ION IMPLANTATION

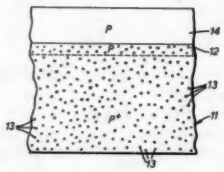
Yoshiaki Matsushita, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Continuation of Ser. No. 630,689, Jul. 13, 1984, abandoned. This application Jun. 2, 1987, Ser. No. 57,672

Claims priority, application Japan, Jul. 29, 1983, 58-138857

Int. Cl.[4] H01L *21/322, 21/265*

U.S. Cl. 437—11 **3 Claims**



1. A process for producing a semiconductor substrate comprising the steps of:

heating a semiconductor substrate material with a first resistivity at a temperature not less than 1100° C. in order to change a major surface of said substrate material into a high resistivity semiconductor layer with a second resistivity higher than said first resistivity, said high resistivity semiconductor layer having resistivity more than 1 ohm cm at a depth of 1.5 um from said major surface of said substrate material,

implanting electrically inert impurities into said major surface of said substrate material to produce defect centers in said high resistivity semiconductor layer.

heating said substrate material at a temperature ranging from 600° to 900° C. to generate micro defects in both of said substrate material and said high resistivity semiconductor layer, and

providing a single crystal semiconductor layer with a third resistivity between said first and second resistivity on said major surface of said substrate material, said third resistivity being larger than said first resistivity.

4,885,258

METHOD FOR MAKING A THIN FILM TRANSISTOR USING A CONCENTRIC INLET FEEDING SYSTEM

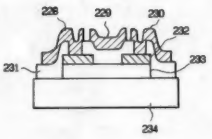
Shunichi Ishihara, Kanagawa; Hirokazu Ootoshi, Tokyo; Masaaki Hirooka, Ibaragi; Junichi Hanna, Kanagawa, and Isamu Shimizu, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 163,200, Feb. 26, 1988, abandoned, which is a continuation of Ser. No. 945,573, Dec. 23, 1986, abandoned. This application Nov. 1, 1988, Ser. No. 267,701

Claims priority, application Japan, Dec. 26, 1985, 60-292312

Int. Cl.[4] H01L *21/265, 21/20*

U.S. Cl. 437—40 **10 Claims**



1. A process for forming an improved amorphous silicon thin-film transistor comprising an insulating substrate, a first layer formed from a film of non-doped amorphous silicon semiconductive material deposited on the surface of the substrate, a second layer formed from a film of n-type impurity doped amorphous silicon material, a third layer formed from a film of amorphous silicon insulating material, a gate electrode formed from a metallic thin film, a source electrode formed from a metallic thin film and a drain electrode formed from a metallic thin film, the gate electrode being separated from the first layer by the third layer, the second layer being situated between the first layer and the source electrode and between the first layer and the drain electrode, said process comprising the steps of:

(a) maintaining the substrate at an elevated temperature in an evacuated film-forming space;

(b) introducing a gaseous starting material for formation of a deposited film via a first gas transportation conduit into the evacuated film-forming space wherein the gaseous starting material is capable of being a constituent for a film, but essentially incapable of contributing to film formation when the gaseous starting material is in an original state;

(c) introducing a gaseous halogenic oxidizing agent via a second gas transportation conduit, wherein the first and second gas transportation conduits are concentric and terminate adjacent to the substrate forming a reaction space, the gaseous halogenic oxidizing agent having an oxidizing property on the gaseous starting material in the reaction space to effect chemical contact therebetween and to thereby cause a chemical reaction in the absence of a plasma in the reaction space, to generate a plurality of precursors containing excited precursors, wherein at least one of the precursors form the film constituting at least one of the first, second and third layers; and

(d) maintaining the distance between the outlet of the first and second concentric gas transportation conduits and the surface of the substrate from 5 millimeters to 15 centimeters.

4,885,259

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE, IN WHICH METAL SILICIDE IS PROVIDED IN A SELF-REGISTERED MANNER

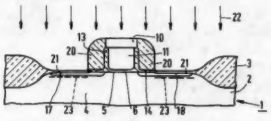
Kazimierz Osinski, and Ingrid J. Voors, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 28, 1988, Ser. No. 290,923

Claims priority, application Netherlands, Jan. 29, 1988, 8800222

Int. Cl.[4] H01L *21/00, 21/02, 21/285, 21/26*

U.S. Cl. 437—41 6 Claims



1. A method of manufacturing a semiconductor device including an insulated gate field effect transistor comprising the steps of

(a) providing a layer of silicon oxide on a surface of a semiconductor substrate of monocrystalline silicon,

(b) covering said layer of silicon oxide with a layer of doped polycrystalline silicon,

(c) forming a mask containing silicon nitride on said layer of doped polycrystalline silicon,

(d) etching said layer of doped polycrystalline silicon to said layer of silicon oxide using said mask as an etching mask to form a gate electrode of said doped polycrystalline silicon under said etching mask,

(e) maintaining said etching mask on said gate electrode,

(f) forming source and drain zones in said monocrystalline silicon of said semiconductor substrate using said etching mask,

(g) forming edge isolation parts about sides of said gate electrode by the steps of covering said surface with a further layer of silicon oxide and anisotropically etching said further layer,

(h) removing said etching mask by exposing said polycrystalline silicon of said gate electrode, and exposing said source and drain zones by removing any remaining layer of silicon oxide,

(i) covering said gate electrode and said source and drain zones with a layer of metal-containing material,

(j) forming a metal silicide from said metal-containing layer contacting said gate electrode and said source and drain zones by heating and reacting said metal-containing layer with said polycrystalline silicon of said gate electrode and with said monocrystalline silicon of said source and drain zones, and

(k) removing any parts of said metal-containing layer free of contact with said polycrystalline silicon gate electrode or with said monocrystalline silicon source and drain zones.

4,885,260

METHOD OF LASER ENHANCED VAPOR PHASE GROWTH FOR COMPOUND SEMICONDUCTOR

Yuzaburo Ban, Osaka; Masaya Manno, Kadoma; Minoru Kubo, Katano; Mototsugu Morisaki, Osaka, and Mototsugu Ogura, Takaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 16, 1988, Ser. No. 156,525

Claims priority, application Japan, Feb. 17, 1987, 62-33804; Feb. 18, 1987, 62-35041; Mar. 17, 1987, 62-61547; Jun. 22, 1987, 62-154663

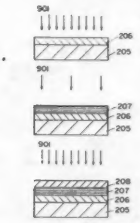
Int. Cl.[4] H01L *21/20, 21/26*

U.S. Cl. 437—81 4 Claims

1. A method for producing a compound semiconductor multilayer structure by vapor phase growth comprising the steps of:

continuously supplying and maintaining compound gases during the growth of each layer, each of said gases consisting of at least a constituent element of epitaxial layers to be grown on a surface of a substrate heated to a desired growth temperature;

growing a first compound epitaxial layer on said surface of



said substrate by irradiating said surface of said substrate with light having a predetermined intensity;

growing a second compound epitaxial layer on a surface of said first compound epitaxial layer by irradiating the said surface of said first compound epitaxial layer with light while gradually increasing or decreasing the intensity of said light or by switching on and off said light whereby the composition of the said second compound epitaxial layer changes abruptly or continuously during growth.

4,885,261

METHOD FOR ISOLATING A SEMICONDUCTOR ELEMENT

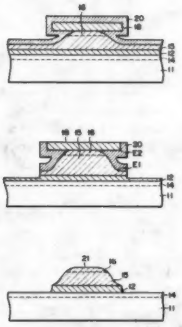
Kuniyoshi Yoshikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 140,649, Jan. 4, 1988, abandoned. This application Mar. 10, 1989, Ser. No. 320,817

Claims priority, application Japan, Jan. 13, 1987, 62-5821

Int. Cl.[4] H01L *21/08*

U.S. Cl. 437—228 13 Claims



1. A method for isolation of a semiconductor element in a semiconductor device comprising:

a step of forming a surface protective film on a semiconductor substrate;

a step of forming an insulation film on said surface protective film;

a step of forming a first mask material film on said insulation film;

a step of selectively removing said first mask material film at

an area thereof equal to a width of an element isolation region;

a step of isotropically etching said insulation film to produce a sloped portion of said insulation film immediately underneath said first mask material film with a rising edge portion of said sloped portion being aligned in a vertical direction with an edge portion of said first mask material film;

a step of forming a second mask material film over the entire surface;

a step of anistropically etching said second mask material film;

a step of isotropically etching said insulation film and said surface protective film, to expose said semiconductor substrate; and

a step of removing said first mask material film and said second mask material film by means of anisotropic etching.

4,885,262

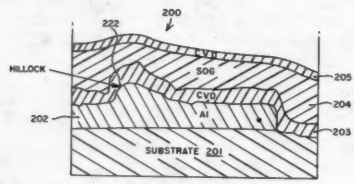
CHEMICAL MODIFICATION OF SPIN-ON GLASS FOR IMPROVED PERFORMANCE IN IC FABRICATION

Chiu H. Ting, Saratoga; Thomas G. Rucker, Palo Alto, both of Calif., and Zbigniew P. Sobczak, Andover, N.J., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 8, 1989, Ser. No. 320,763

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—231 **10 Claims**



1. A process for silylating spin-on-glass comprising the steps of:

depositing a first conductive layer on a semiconductor body;

forming said first conductive layer such that openings are created between patterned sections of said first conductive layer;

depositing a first dielectric layer on said first conductive layer;

depositing a glass layer on said first dielectric layer;

annealing said glass layer in an ambient;

cooling said semiconductor device in an nitrogen flow bubbled through an organosilicon compound.

4,885,263

CERAMIC FOAM FILTER AND PROCESS FOR PREPARING SAME

Jerry W. Brockmeyer, Hendersonville; Leonard S. Aubrey, Arden, and James E. Dore, Hendersonville, all of N.C., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 23, 1987, Ser. No. 29,184

Int. Cl.[4] C04B *38/06, 35/56*

U.S. Cl. 501—81 **8 Claims**

1. A process for preparing a ceramic foam filter for filtering molten metal which comprises:

forming an aqueous slurry of a thixotropic ceramic composition including silicon carbide with a colloidal silica binder for imparting an improved level of thixotropy as a result of its colloidal nature, said composition having a solids content of at least 50% silicon carbide and at least 3% silica;

providing a reticulated organic polymer foam;

impregnating said foam with said aqueous slurry;

drying and heating said impregnated polymeric foam to remove the organic components thereof; and

firing at an elevated temperature to produce said ceramic foam filter.

4,885,264

PRESSURE-SINTERED POLYCPYSTALLINE MIXED MATERIALS WITH A BASE OF HEXAGONAL BORON NITRIDE, OXIDES AND CARBIDES

Peter Sindlhauser, Probstriedd; Klaus Hunold, Lauben, and Alfred Lipp, Bad Worishofen, all of Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 28, 1989, Ser. No. 345,201

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1988, 3824849

Int. Cl.[4] C04B *35/52, 35/70*

U.S. Cl. 501—87 **6 Claims**

1. A pressure-sintered polycrystalline mixed material with a base of powders of boron nitride, an oxide and a carbide, in which the boron nitride fraction is hexagonal and is present in an amount of from about 30 to about 85% by weight, the oxide is selected from the group consisting of zirconium oxide and magnesium oxide and is from about 10 to about 50% by weight, and the carbide is selected from the group consisting of silicon carbide, titanium carbide and zirconium carbide and is from about 5 to about 20% by weight, and which have a density of at least about 94% of the theoretically possible density, the weight being based on the total weight of said mixed material.

4,885,265

MOLDABLE FIBER-CONTAINING CERAMIC MASS

William B. Hillig, Ballston Lake, and Henry C. McGuigan, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,097

The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.[4] C04B *35/76*

U.S. Cl. 501—95 **19 Claims**

1. A process for producing a shaped fiber-containing porous body having an open porosity ranging from about 30% by volume to about 80% by volume of said body which consists essentially of preparing a suspension of ceramic material in a liquid vehicle, said ceramic material consisting essentially of a mixture of fibers and particulates, said fibers having an aspect ratio ranging from about 10 to less than about 200 and being selected from the group consisting of aluminum oxide, beryllium oxide, silicon carbide, silicon nitride, titanium carbide, titanium diboride, zirconium carbide, zirconium diboride and a mixture thereof, said particulates being filler particulates selected from the group consisting of aluminum oxide, beryllium oxide, silicon carbide, silicon nitride, titanium carbide, titanium diboride, zirconium carbide, zirconium diboride and a mixture thereof, the volume ratio of said fibers to said particulates ranging from about 1:5 to about 1:1, said particulates having an equivalent diameter ranging from greater than about 0.2μ to less than about 3μ, the ratio of the largest to the smallest dimension of said particulates being less than about 10 and the largest dimension of said particulates being less than about $\frac{1}{4}$ of the length of said fibers, said ceramic material being present in an amount ranging from greater than about 5% by volume to about 30% by volume of the total volume of said suspension, said fibers being present in an amount greater than about 2% by volume of the total volume of said suspension, removing a sufficient portion of said liquid vehicle to leave a moldable ceramic mass, said liquid vehicle ranging from about 33% by volume to about 66% by volume of said moldable ceramic mass, molding said ceramic mass to produce a shaped molded body, and removing the liquid vehicle from the resulting

shaped molded body leaving no residue detectable by x-ray diffraction analysis to produce said porous body, said porous body being of simple, hollow and/or complex shape, said porous body being useful for producing a ceramic composite which does not differ significantly in shape and size therefrom and which consists essentially of a continuous matrix phase and a discontinuous filler phase, said porous body being characterizable as being infiltratable with molten ceramic infiltrant to produce said composite wherein said infiltrant forms said matrix phase.

4,885,266

ZIRCONIA CERAMIC MATERIALS AND METHOD FOR MAKING SAME

Robert R. Hughan, Glen Iris; Richard H. J. Hannink, Oakleigh; Michael V. Swain, East Malvern; Robert K. Stringer, Heidelberg; Michael J. Murray, Surrey Hills, and Ronald C. Garvie, Beaumaris, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

PCT No. PCT/AU83/00069, § 371 Date Feb. 1, 1984, § 102(e) Date Feb. 1, 1984, PCT Pub. No. WO83/04247, PCT Pub. Date Dec. 8, 1983

Continuation of Ser. No. 4,255, Jan. 5, 1987, abandoned, which is a continuation of Ser. No. 582,567, Feb. 1, 1984, abandoned. This PCT application May 27, 1983, Ser. No. 218,419

Claims priority, application Australia, Jun. 1, 1982, PF4238

Int. Cl.[4] C04B *35/48*

U.S. Cl. 501—104 **19 Claims**

1. A magnesia partially stabilised zirconia ceramic material having

(a) a cubic phase zirconia content in the range from 70 percent (by volume) to 25 percent (by volume) of the ceramic material; and

(b) a magnesia content in the range from 3.0 percent (by weight) to 3.65 percent (by weight) of the ceramic material;

the material being characterised in that:

(c) it contains an additive which is selected from the group consisting of strontia, baria and rare earth oxides which are glass formers, with silica are insoluble in zirconia, and do not react with magnesia, and any mixture thereof, in the range from 0.05 percent (by weight) to 1.00 percent (by weight) of the ceramic material;

(d) the microstructure of the material comprises grains of cubic stabilised zirconia, each grain containing precipitates of tetragonal zirconia which is transformable on the application of tensile stress or upon heat treatment to monoclinic zirconia, said precipitates being lenticular in shape and having an average length of about 150 nm in their longest dimension, and each grain containing grain matrix monoclinic zirconia as transformed tetragonal zirconia precipitates in a first specified range of monoclinic zirconia content;

(e) a ground surface of the material contains monoclinic zirconia in a second specified range of monoclinic zirconia content;

(f) a polished surface of the material contains monoclinic zirconia in a third specified range of monoclinic zirconia content;

said first, second and third specified ranges being selected from the group consisting of the following four combinations of ranges:

(i) the first specified range of monoclinic zirconia content is from 0 to 10 percent (by volume), the second specified range is from 0 to 40 percent (by volume) and the third specified range is from 0 to 10 percent (by volume); whereby the ceramic material is especially suitable for use in low temperature applications;

(ii) the first specified range of monoclinic zirconia content is from 5 to 40 percent (by volume), the second specified range is from 25 to 50 percent (by volume) and the third specified range is from 5 to 50 percent (by volume); whereby the ceramic material is especially suitable for use in the temperature range from 400° C. to 700° C.;

(iii) the first specified range of monoclinic zirconia content is from 10 to 50 percent (by volume), the second specified range is from 25 to 60 percent (by volume) and the third specified range is from 10 to 60 percent (by volume); whereby the ceramic material is especially suitable for use in the temperature range from 700° C. to 1000° C.; and

(iv) the first specified range of monoclinic zirconia content is from 15 to 60 percent (by volume), the second specified range is from 15 to 75 percent (by volume) and the third specified range is from 5 to 75 percent (by volume); whereby all the tetragonal precipitate has been transformed into monoclinic zirconia; whereby the ceramic material is especially suitable for use at temperatures in excess of 1000° C.

4,885,267

PEROVSKITE CERAMIC AND FABRICATION METHOD THEREOF

Hideyuki Takahara, Chofu, and Kazuo Kiuchi, Tokyo, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

PCT No. PCT/JP85/00490, § 371 Date Apr. 17, 1986, § 102(e) Date Apr. 17, 1986, PCT Pub. No. WO86/01497, PCT Pub. Date Mar. 13, 1986

Continuation of Ser. No. 855,745, Apr. 17, 1986, abandoned. This PCT application Sep. 2, 1985, Ser. No. 135,521

Claims priority, application Japan, Sep. 3, 1984, 59-182702; Aug. 12, 1985, 60-175643; Aug. 12, 1985, 60-175644

Int. Cl.[4] C04B *35/26*

U.S. Cl. 501—134 **15 Claims**

1. A perovskite ceramic comprising two kinds of perovskite ceramic materials having respective high dielectric constants and mutually different Curie temperatures coexisting therein without forming a complete solid solution thereof, said two kinds of perovskite ceramic materials having the formula $Pb(Fe_{\frac{1}{2}}W_{\frac{1}{2}})_{x_i}(Fe_{\frac{1}{2}}Nb_{\frac{1}{2}})_{1-x_i}O_3$, wherein in a first kind of perovskite ceramic material $i=1$ and $0.1 \leqq x_i \leqq 0.2$, and in a second kind of ceramic perovskite material $i=2$ and $0.5 \leqq x_2 \leqq 0.9$, said two kinds of perovskite ceramic material coexisting in the mixing ration $0.5 \leqq xhd\ 2/(x_1+x_2) \leqq 0.8$.

10. A process for preparing a perovskite ceramic as claimed in claim 7 wherein a minute amount of an oxide which is an oxide of a metal element incapable of substituting for atoms occupying the body-centered positions of crystal lattices of said two or more kinds of perovskite ceramic materials, and which has a higher melting point than the melting points of said perovskite ceramic materials is added to said perovskite ceramic materials.

4,885,268

CATALYST COMPOSITION AND METHOD

Edward J. Dowd, Palatine, Ill., assignor to ARI Technologies, Inc., Palatine, Ill.

Filed Mar. 30, 1988, Ser. No. 176,110

Int. Cl.[4] B01J *31/22*

U.S. Cl. 502—163 **9 Claims**

1. A catalyst composition consisting essentially of a stable fluid slurry or suspension of a blend of first and second metal phthalocyanine sulfonate components in water, said first component comprising a metal phthalocyanine disulfonate compound, said disulfonate compound comprising at least 50 wt. % of the metal phthalocyanine sulfonates in said first component, said second component comprising a metal phthalocyanine tetrasulfonate compound, said tetrasulfonate compound comprising at least 99 wt. % of the total metal phthalocyanine sulfonates in said second component, said second component comprising between about 9 and 91 wt. % of the total of said first and second components, and the total concentration of said metal phthalocyanine sulfonates being greater than zero and up to about 3 lbs. per gallon of said slurry or suspension.

4,885,269

METHOD OF OXIDATION OF THE SURFACE OF A CATALYST CARRIER BODY AND A CATALYST CARRIER BODY PRODUCED ACCORDING TO THE METHOD

Theodor Cyron, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Emitec Gesellschaft fur Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,671
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708515
Int. Cl.[4] B01J *32/00*
U.S. Cl. 502—439 11 Claims

1. A method for oxidation of the surface of a catalyst carrier body made from an aluminum-containing iron alloy, which comprises the step of oxidizing the surface of said catalyst carrier body in an oxygen-containing atmosphere with the exclusion of nitrogen, and forming a film of aluminum oxide substantially free of nitrides on the surface of said catalyst carrier body.

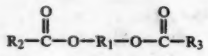
4,885,270

NOVEL THERMOSENSITIVE RECORDING SHEET

Kikuo Tsuchiya, Nishinomiya; Shingo Araki, Settsu; Masaji Inagaki, Ashiya; Yumi Kudoh, Osaka, and Teijiro Kitao, Tondabayashi, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,158
Claims priority, application Japan, Apr. 6, 1987, 62-82944
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—209 12 Claims

1. A thermosensitive recording sheet comprising a substrate sheet and a film coated on said substrate sheet, said film comprising a color-forming lactone compound, an acidic substance and a sensitizer, said sensitizer being an o-hydroxy aromatic acid ester represented by the formula

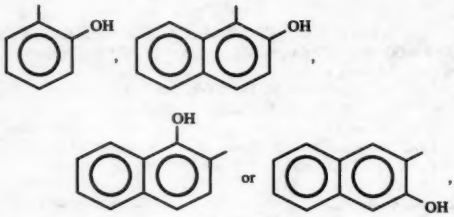


(I)

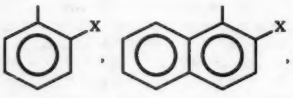
wherein

R_1 denotes an alkylene group, a cycloalkylene group, an oxyalkylene group, a thioalkylene group, a phenylene group, a xylylene group or a naphthylene group,

R_2 denotes



R_3 denotes



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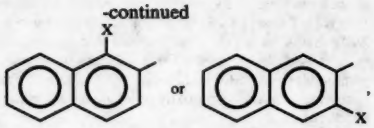


in which X denotes a hydroxy group or a hydrogen atom, provided a benzene ring and a naphthalene ring in R_1, R_2 and R_3 may be substituted by a lower alkyl group, a nitro group or a halogen atom.

4,885,271

HEAT-SENSITIVE RECORDING MATERIAL

Hiroshi Kawakami, and Akira Igarashi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 5, 1987, Ser. No. 11,480
Claims priority, application Japan, Feb. 5, 1986, 61-23465
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—214 16 Claims

1. A heat-sensitive recording material produced by a process comprising providing on a support a heat-sensitive color forming layer containing a colorless or slightly colored electron donating dye precursor, an electron accepting compound which is capable of forming color by reaction with said electron donating dye precursor and a hardening agent which is capable of hardening a binder in a protective layer by reaction with said binder, and providing on said color-forming layer a protective layer containing a binder and no hardener.

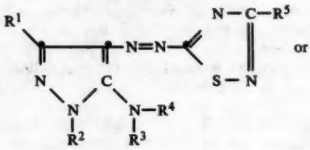
4,885,272

THIADIAZOLYL-AZO-PYRAZOLE YELLOW DYE-DONOR ELEMENT FOR THERMAL DYE TRANSFER

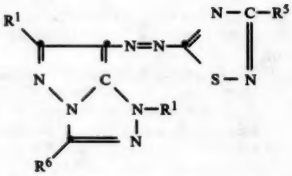
Derek D. Chapman, Rochester, and Helmut Weber, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 190,924, May 6, 1988, abandoned. This application Feb. 27, 1989, Ser. No. 316,273
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 18 Claims

10. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric binder and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein said dye has the formula:



or



wherein each R^1 independently represents hydrogen, a substituted or unsubstituted alkyl group having from 1 to about 10 carbon atoms; a cycloalkyl group having from about 5 to about

7 carbon atoms or an aryl group having from about 6 to about 10 carbon atoms;

R^2 represents a substituted or unsubstituted alkyl group having from 1 to about 10 carbon atoms; a cycloalkyl group having from about 5 to about 7 carbon atoms or an aryl group having from about 6 to about 10 carbon atoms;

R^3 and R^4 each independently represents R^1, with the proviso that at least one of R^3 and R^4 is hydrogen;

R^5 represents hydrogen; halogen; cyano; a substituted or unsubstituted alkyl, alkylthio, alkylsulfonyl, alkylsulfinyl, alkoxycarbonyl, carbamoyl or alkoxy group having from 1 to about 10 carbon atoms; a substituted or unsubstituted arylthio, arylsulfonyl, arylsulfinyl, aryloxy or aryl group having from about 6 to about 10 carbon atoms; or a substituted or unsubstituted acylamido group having from about 1 to about 7 carbon atoms; and

R^6 represents hydrogen; halogen; cyano; alkoxy; a substituted or unsubstituted alkyl group having from 1 to about 1 0 carbon atoms; a cycloalkyl group having from about 5 to about 7 carbon atoms or an aryl group having from about 6 to about 10 carbon atoms.

4,885,273

METHOD OF PRODUCING A SUPERCONDUCTING WIRE USING ALLOY PREFORM

Mamoru Sugimoto; Osamu Kohno; Yoshimitsu Ikeno; Nobuyuki Sadakata; Shin'ya Aoki, and Mikio Nakagawa, all of Tokyo, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,019

Claims priority, application Japan, Mar. 20, 1987, 62-67103; Mar. 20, 1987, 62-67113; Mar. 20, 1987, 62-67105; Mar. 20, 1987, 62-67104; May 26, 1987, 62-128852; Jun. 8, 1987, 62-142453; Aug. 14, 1987, 62-202835; Sep. 3, 1987, 62-220909; Sep. 22, 1987, 62-237952

Int. Cl.[4] B05D *5/12;* H01L *39/24*

U.S. Cl. 505—1 **9 Claims**

1. A method of producing a superconductor including an A-B-C-D system oxide superconductor wherein the A contains at least one element selected from the group consisting of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu, the B at least one element selected from the group consisting of Be, Sr, Mg, Ca, Ba and Ra, the C copper and the D oxygen, comprising the steps of:

(a) arranging a material containing one of said A and B inside or outside an elongated tubular layer to surround the tubular layer to form a preform, the tubular layer including an alloy of copper and the other of A and B, the material or the tubular layer including oxygen;

(b) subsequently, reducing in thickness the preform to form a thickness reduced composite; and

(c) heating the thickness reduced composite to produce the oxide superconductor.

4,885,274

PERFUME COMPOSITION

Nobuo Yamada, and Toyohiko Kobayashi, both of Yokohama, Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

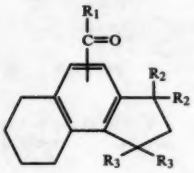
PCT No. PCT/JP87/00140, § 371 Date Nov. 23, 1987, § 102(e) Date Nov. 23, 1987, PCT Pub. No. WO88/06435, PCT Pub. Date Sep. 7, 1988

PCT Filed Mar. 5, 1987, Ser. No. 139,253

Int. Cl.[4] A61K *7/46*

U.S. Cl. 512—16 **11 Claims**

1. A hexahydro-1H-cyclopenta(a)naphthalene compound of the formula



wherein, R_1 is a methyl group or an ethyl group and either one of R_2 and R_3 is a methyl group and the other of R_2 and R_3 is a hydrogen atom.

6. A perfumery composition comprising a plurality of odoriferous chemicals together with from 0.001 to 10% by weight of said composition of at least one compound of the formula of claim 1.

4,885,275

VANCOMYCIN-HCL SOLUTIONS AND THE LYOPHILIZATION THEREOF

Robert L. Robison, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 15, 1987, Ser. No. 109,885

Int. Cl.[4] A61K *37/02;* C07K *7/64, 9/00*

U.S. Cl. 514—8 **13 Claims**

1. An aqueous gel-free formulation of vancomycin hydrochloride comprising between about 12% and about 50% w/v of vancomycin hydrochloride and between about 1% and about 20% v/v of a gel-inhibiting compound selected from among an alcohol of the group ethanol, n-propanol, isopropanol or propylene glycol, an ester of the group n-isopropyl acetate or isopropyl acetate and a ketone of the group acetone or methyl ethyl ketone.

4,885,276

CYCLOSPORIN ANALOGS WITH MODIFIED "C-9 AMINO ACIDS"

Bruce E. Witzel, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

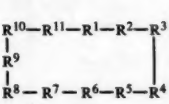
Division of Ser. No. 57,196, Jun. 3, 1987. This application Oct. 24, 1988, Ser. No. 261,868

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[4] A61K *37/07;* C07K *5/12*

U.S. Cl. 514—11 **8 Claims**

1. A compound of formula

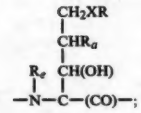


(I)

wherein

R^1 is MeBMT;

R^2 is



where X, R, R_a and R_e are as defined below;

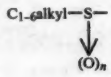
R is

(1) hydrogen;

(2) loweralkyl;

(3) loweralkenyl;

(4) haloloweralkyl;
(5) aryl;
(6) oxyloweralkyl comprising lower alkyl and hydroxy lower alkyl;
(7) thioloweralkyl comprising alkyl thio lower alkyl and mercapto lower alkyl;
(8) heteroaryl;
the aryl or heteroaryl group above can be substituted with one or more functional groups selected from a group consisting of
(a) C_{1-6} alkyl,
(b) C_{1-6} alkanoyl;
(c) C_{1-6} haloalkyl;
(d) halo;
(e) cyano;
(f) hydroxy C_{1-3} alkyl;
(g) C_{1-6} alkoxy;
(h)



where n is 0, 1 or 2;
(i) $-NR_bCOR_c$ wherein R_b and R_c independently are H or C_{1-6} alkyl;
(j) $-NO_2$;
(k) $-NR_bR_c$;
(l) $-OR_b$;
(m) $-CONR_bR_c$
(n) $-COR_b$;
(o) $-NR_bCONR_bR_c$;
(p) $-NR_bCOR_c$;
(q) $-OCOR_b$;
(r) $-SCOR_b$; or
(s) $-OCH_2O-$; and
X is S, SO, SO_2, O, or NR_b
R_a is loweralkyl;
R_e is loweralkyl; loweralkylphenyl; or aryl;
R^3 is sarcosyl; α-(methylmercapto)-sarcosyl; N-methyl-D-alanyl; N-methyl-L-alanyl; or D-prolyl;
R^4 is N-methyl-L-leucyl;
R^5 is L-valyl; or norvalyl;
R^6 is N-methyl-L-leucyl;
R^7 is L-ananyl; L-2-aminobutyryl; or L-phenylalanyl;;
R^8 is D-alanyl or L-alanyl;
R^9 is N-methyl-L-leucyl; or N-methyl-L-valyl;
R^{10} is N-methyl-L-leucyl; or L-leucyl; and
R^{11} is N-methyl-L-valyl; L-valyl; N-methylleucyl; or L-2-aminobutyryl.

4,885,277

ANTICOAGULANT THERAPY

Peter P. Nawroth, Bornshof, Fed. Rep. of Germany; David M. Stern, Great Neck, N.Y., and George D. Wilner, St. Louis, Mo., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 916,773, Oct. 9, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 118,316

Int. Cl.[4] A61K *37/02*; C07K *7/08*

U.S. Cl. 514—15 **6 Claims**

1. A peptide having the formula Asp-Gly-Asp-Gln-Cys which selectively interacts with endothelial cellular receptors for Factor IX and Factor IXa.

4,885,278

5-SUBSTITUTED 10-CYANOMETHYLENETHIENO(3,4-B)BENZAZEPINES

Gerd Steiner, Kirchheim; Hans-Juergen Teschendorf, Dudenhofen; Liliane Unger, Ludwigshafen, and Rudolf Binder, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

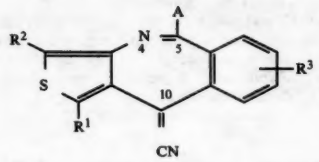
Filed May 20, 1988, Ser. No. 196,605

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717069

Int. Cl.[4] C07D *495/04*; A61K *31/55*

U.S. Cl. 514—215 **7 Claims**

1. A 5-substituted 10-cyanomethylenethieno(3,4-b)-benzazepine of the formula (I):



I

wherein R^1 and R^2 are each halogen or an alkyl of 1 to 3 carbon atoms; and R^3 is hydrogen, halogen or an alkyl group of 1 to 3 carbon atoms; A is $-NH^4R^5$, wherein R^4 and R^5 form, together with the connecting nitrogen atom, a 5- to 7-membered saturated ring, which ring atoms are all carbon or which contain an additional nitrogen or an oxygen atom, wherein said additional nitrogen atom is unsubstituted or is substituted by an alkyl of 1 to 3 carbon atoms, hydroxyalkyl of 2 or 3 carbon atoms, alkoxyalkyl, wherein the alkyl or alkoxy is of 1 to 3 carbon atoms, cycloalkyl or cycloalkylmethyl of 3 to 7 carbon atoms in the cycloalkyl ring, alkynyl of 2 to 5 carbon atoms, and additionally by oxygen in the form of an N-oxide; or A is $-NHR^6$ is aminoalkyl of 2 to 7 carbon atoms, wherein the amine nitrogen atom is unsubstituted or substituted by alkyl of 1 to 5 carbon atoms, or is a constituent of a 5- to 7-membered saturated ring, which ring atoms are all carbon or which contain an additional nitrogen or oxygen atom, wherein said additional nitrogen atom is unsubstituted or substituted by lower alkyl of 1 to 3 carbon atoms or hydroxyalkyl of 2 to 3 carbon atoms; and physiologically-acceptable acid addition salts thereof.

4,885,279

PHARMACEUTICAL FORMULATION CONTAINING INDOMETHACIN

Kim D. Rainsford, No. 1 Butt Lane, Great Wilbraham, Cambridgeshire, England, and Michael W. Whitehouse, 43 Malcolm Street, Millswood, South Australia, Australia

Filed Mar. 27, 1987, Ser. No. 30,563

Claims priority, application United Kingdom, Mar. 27, 1986, 8607662

Int. Cl.[4] A61K *31/53, 31/70*

U.S. Cl. 514—23 **13 Claims**

1. A pharmaceutical formulation comprising indomethacin or a salt thereof, a pharmaceutically-acceptable metabolisable carbohydrate, and an alkali metal, alkaline earth metal, or ammonium salt of a metabolic carboxylic acid, the weight ratios of both indomethacin:carbohydrate and indomethacin:-carboxylic acid salt being in the range of 1:3 to 1:20, provided that at least one of said weight ratios is within the range 1:10 to 1:20.

4,885,280

NOVEL 14-AMINO STEROIDS

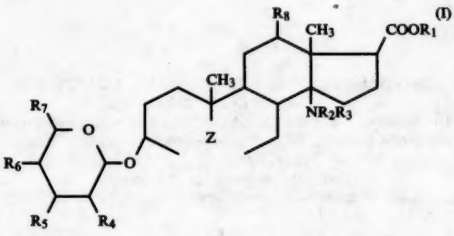
Francois-Xavier Jarreau, Versailles, and Jean-Jacques Koenig, Vernou la Celle S/Seine, both of France, assignors to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Filed Sep. 30, 1988, Ser. No. 252,240

Int. Cl.[4] C07J *1/00, 41/00, 17/00;* A61K *31/58*

U.S. Cl. 514—26 14 Claims

1. New androstane 17-carboxylic acid esters represented by general formula (I)



wherein R_1 represents a lower alkyl group containing 1 to 4 carbon atoms, a lower alkyl group from 2 to 4 carbon atoms substituted by an amino group, or an aralkyl group from 6 to 12 carbon atoms, R_2 and R_3, which may be the same or different, represent a hydrogen atom or a lower alkyl group containing 1 to 4 carbon atoms, R_4 represents a hydrogen atom, a hydroxy group, or an acetoxy group, R_5 represents a hydroxy group or an acetoxy group, or R_4 and R_5 represent together a divalent alkylenedioxy group, R_6 represents a hydroxy a methoxy group or acetoxy group, R_7 represents a methyl group or a hydroxy-methyl group, R_8 represents a hydrogen atom or a hydroxy group and —Z— represents either a —C— group, or a =C-carbon where the double linkage is at the 4- or 5-position of the steroid nucleus.

4,885,281

SUCRALFATE SUSPENSION

Ullrich Hanstein, Mühltal, and Lothar Bauer, Pfungstadst, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 878,869, Apr. 22, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 171,347

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430807

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—53 4 Claims

1. Pharmaceutical formulations in the form of suspensions containing sucralfate, characterised in that they contain, based on the sucralfate, 1–5% by weight of xanthan gum and 1–12.5% by weight of at least one peptiser.

4,885,282

TREATMENT OF HYPERHIDROSIS, ICHTHYOSIS AND WRINKLING

Carl R. Thornfeldt, 1054 NW. 2nd Ave., Ontario, Oreg. 97914

Continuation-in-part of Ser. No. 69,071, Jul. 2, 1987, abandoned. This application Mar. 8, 1988, Ser. No. 160,042

Int. Cl.[4] H61K *31/19, 31/715*

U.S. Cl. 514—53 27 Claims

1. A method for the treatment of skin suffering from hyperhidrosis, ichthyosis or wrinkling, said method comprising applying to the affected area a therapeutically effective amount of a compound selected from the group consisting of mono- and dicarboxylic acids having 4 to 18 carbon atoms, mercapto derivatives thereof, salts thereof, and esters thereof.

4,885,283

PHOSPHINIC ACID DERIVATIVES

Michael J. Broadhurst, Royston; Balraj K. Handa, Welwyn Garden City; William H. Johnson; Geoffrey Lawton, both of Hitchin, and Peter J. Machin, London, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

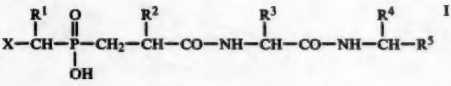
Filed Dec. 1, 1987, Ser. No. 126,643

Claims priority, application United Kingdom, Dec. 15, 1986, 8629876; Sep. 22, 1987, 8722245

Int. Cl.[4] A61K *31/675;* C07F *9/30*

U.S. Cl. 514—78 38 Claims

33. A method of controlling or preventing a degenerative joint disease which comprises administering to a host requiring such treatment an effective amount of a compound of the formula



wherein

R^1 is a hydrogen, C_1–C_6-alkyl or phenyl-(C_1–C_6-alkyl) wherein phenyl is unsubstituted or substituted with one or more substituents selected from C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen or trifluoromethyl;

R^2 is a C_2–C_5-alkyl;

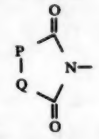
R^3 is isopropyl, isobutyl, benzyl, p-hydroxybenzyl, hydroxymethyl, mercaptomethyl, 1-hydroxyethyl, 2-methylthioethyl, carboxymethyl, 2-carboxyethyl, 3-quanidinopropyl or aminobutyl, wherein a hydroxy group can be protected by a tert-butylbenzyl, tetrahydropyranyl or acetyl group, a mercapto group can be protected by a tert-butyl or benzyl group, an amino group can be acylated by a tert. butoxycarbonyl, benzyloxycarbonyl, formyl, trityl, trifluoroacetyl, 2-(biphenylyl)isopropoxycarbonyl or isobornyloxycarbonyl group, or can be sulfonylated by a C_1–C_6-alkane-sulfonyl, benzenesulfonyl or p-toluenesulfonyl group, and a carboxyl group can be amidated to an aminocarbonyl, (C_1–C_6-alkyl-)aminocarbonyl, di(C_1–C_6-alkyl)aminocarbonyl or phenylaminocarbonyl;

R^4 is a hydrogen or methyl; or

R^3 and R^4 taken together are a group of the formula —$(CH_2)_n$— in which n is an integer from 4 to 11 inclusive;

R^5 is a hydrogen, C_1–C_6-alkyl, carbonyl, C_1–C_6-alkoxycarbonyl or C_1–C_6-alkylaminocarbonyl; and

X is either a cyclic imido group of the formula



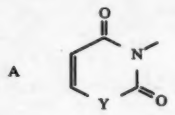
(b)

wherein

P and Q taken together are a group of the formula —CH(R′)—CH(R′)—, —CH(R′)—CH(R′)—CH(R′)—, —O—CH(R′)—, —N(R′)—CH(R′)—, —N(R′)—N(R′)—, —N=N— or —C(R′)=C(R′)— in which each is a hydrogen; C_1–C_6-alkyl; phenyl unsubstituted or substituted with one or more substituents selected form C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen or trifluoromethyl; phenyl-(C_1–C_6-alkyl) wherein phenyl is unsubstituted or substituted with one or more substituents selected from C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen or trifluoromethyl; C_1–C_6-alkanoylamino; or an acylamino group of the formula H_2N—CH(R)—CONH— wherein R is isopropyl, isobutyl, benzyl, p-hydroxybenzyl, hydroxymethyl, mercaptomethyl, 1-hydroxyethyl, 2-methylthioethyl, carboxymethyl, 2-carboxyethyl, 3-quanidinopropyl or aminobutyl, in which the amino group

can be protected by a tert. butoxycarbonyl, benzyloxycarbonyl, formyl, trityl, trifluoroacetyl, 2-(biphenylyl)-isopropoxycarbonyl or isobornyloxycarbonyl group, or

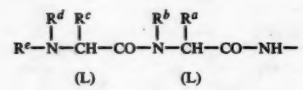
P and Q taken together are unsubstituted 1,2-phenylene, thienylene, 1,2-naphthylene, 2,3-naphthylene, 1,8-naphthylene or 2,3-anthrylene or substituted by one or more substituents selected from C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen, hydroxy, phenyl(C_1–C_6-alkoxy) wherein phenyl is unsubstituted or substituted with one or more substituents selected from C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen or trifluoromethyl, nitro, amino, C_1–C_6-alkanoylamino, mono(C_1–C_6-alkyl)amino, di(C_1–C_6-alkyl)-amino and C_1–C_6-alkylsulfonylamino; or a group of the formula



(c)

wherein

A is the residue of benzene, naphthalene or enthracene which is unsubstituted or substituted by one or more substituents selected from C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen, hydroxy, phenyl-(C_1–C_6-alkoxy) wherein phenyl is unsubstituted or substituted with one or more substituents selected from C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen or trifluoromethyl, nitro, amino, C_1–C_6-alkanoyl-amino, mono(C_1–C_6-alkyl)amino, di(C_1–C_6-alkyl)-amino and C_1–C_6-alkylsulfonylamino and Y is —O—, —NH— or —NR^q in which R^q is hydrogen or C_1–C_6-alkyl, or a group of the formula



(a)

Ra is isopropyl, isobutyl, benzyl, p-hydroxybenzyl, hydroxymethyl, mercaptomethyl, 2-hydroxyethyl, 2-methylthioethyl, carboxymethyl, 2-carboxyethyl, 3-quanidinopropyl or aminobutyl, wherein a hydroxy group can be protected by a tert-butyl benzyl, tetrahydropyranyl or acetyl group, a mercapto group can be protected by a tert-butyl or benzyl group, an amino group can be acylated by a tert. butoxycarbonyl, benzyloxycarbonyl, formyl, trityl, trifluoroacetyl, 2-(biphenylyl)isopropoxycarbonyl or isobornyl-oxycarbonyl group, or can be sulfonylated by a C_1–C_6-alkane-sulfonyl, benzenesulfonyl or p-toluenesulfonyl group, and a carboxyl group can be amidated to an aminocarbonyl, (C_1–C_6-alkyl)aminocarbonyl, di(C_1–C_6-alkyl)-aminocarbonyl or phenylaminocarbonyl,

R^b is hydrogen or

R^a and R^b taken together are trimethylene,

R^c is isopropyl, isobutyl, benzyl, p-hydroxybenzyl, hydroxymethyl, mercaptomethyl, 1-hydroxyethyl, 2-methylthioethyl, carboxymethyl, 2-carboxyethyl, 3-quanidinopropyl or aminobutyl, wherein a hydroxy group can be protected by a tert-butyl benzyl, tetrahydropyranyl or acetyl group, a mercapto group can be protected by a tert-butyl or benzyl group, an amino group can be acylated by a tert. butoxycarbonyl, benzyloxycarbonyl, formyl, trityl, trifluoroacetyl, 2-(biphenylyl)isopropoxycarbonyl or isobornyloxycarbonyl group, or can be sulfonylated by a C_1–C_6-alkanesulfonyl, benzenesulfonyl or a p-toluenesulfonyl group, and a carboxyl group can be amidated to an aminocarbonyl, (C_1–C_6-alkyl)-aminocarbonyl, di(C_1–C_6-alkyl)-aminocarbonyl or phenylaminocarbonyl,

R^d is hydrogen or

R^c and R^d taken together are trimethylene and R^e is a protecting group selected from tert. butoxycarbonyl, benzyloxycarbonyl, formyl, trityl, trifluoroacetyl, 2-(biphenylyl)-isopropoxycarbonyl or isobornyloxycarbonyl, acyl is derived from a C_1–C_6-alkanoic acid or a phenyl-(C_1–C_6-alkanoic) acid wherein phenyl is unsubstituted or substituted with one or more substituents selected from C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen or trifluoromethyl, C_1–C_6-alkyl-sulfonyl or phenylsulfonyl wherein phenyl is unsubstituted or substituted with one or more substituents selected from C_1–C_6-alkyl, C_1–C_6-alkoxy, halogen or trifluoromethyl,

or a pharmaceutically acceptable salt thereof.

36. A method according to claim 33, wherein the compound of formula I is [(R or S)-4-methyl-2-[[(R or S)-2-oxo-3-azacyclotridecyl]carbamoyl]pentyl](1,8-naphthalenedicarboximidomethyl)phosphinic acid.

4,885,284

DIHYDROPYRIDINE-5-PHOSPHONIC ACID CYCLIC PROPYLENE ESTER

Kiyotomo Seto, Funabashi; Sakuya Tanaka, Hasuda, and Ryozo Sakoda, Kashiwa, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

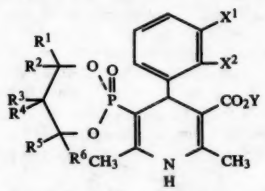
Filed Apr. 14, 1986, Ser. No. 851,158

Claims priority, application Japan, Jan. 22, 1986, 61-11255; Jan. 23, 1986, 61-12755

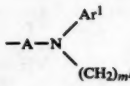
Int. Cl.[4] A61K *31/675;* **C07F** *9/58, 9/65, 9/40*

U.S. Cl. 514—89 **9 Claims**

1. A compound of the formula:



wherein each of R^1, R^2, R^3, R^4, R^5 and R^6 which may be the same or different, is hydrogen or C_1–C_4 alkyl; one of X^1 and X^2 is nitro, fluorine, chlorine, difluoromethoxy or trifluoromethyl and the other is hydrogen; and Y is



where A is C_2–C_6 alkylene, each of Ar^1 and Ar^2 which may be the same or different, is phenyl which may be substituted by chlorine, fluorine or C_1–C_3 alkoxy, and m is zero or an integer up to 4; or a pharmaceutically acceptable salt thereof.

4,885,285

PHOSPHORUS COMPOUNDS, PROCESSES FOR THEIR MANUFACTURE, AND THEIR USE

Gerhard Baschang, Bettingen, Switzerland; Albert Hartmann, Grenzach, Fed. Rep. of Germany; Hans Hirt, Allschwil, Switzerland; Bohumir Lucas, Basel, Switzerland, and Peter Wirz, Münchenstein, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

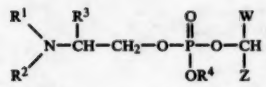
Filed Sep. 9, 1985, Ser. No. 773,707

Claims priority, application Switzerland, Sep. 13, 1984, 4378/84

Int. Cl.[4] A61K *31/66*

U.S. Cl. 514—114 **11 Claims**

1. Method for the prophylaxis and treatment of virus infections in warm-blooded animals, including human beings, characterized in that an effective dose of a cephalin derivative of the formula I



(I)

in which R^1 and R^2 each represents, independently of the other, hydrogen or lower alkyl, R^3 represents hydrogen, lower alkoxycarbonyl, carbamoyl or free or protected carboxy, R^4 represents hydrogen, lower alkyl, phenyl, 2-chlorophenyl, benzyl, 4-nitrobenzyl, 2,3,4,5,6-pentahdroxycyclohexyl, 2,3,4,5,6-pentaacetoxy-cyclohexyl, 2-aminoethyl, 2,3-dihydroxypropyl, trimethylisilyl or 2-hydroxy-3-glycycloxypropyl, W represents hydrogen and Z represents a 1,2-dihydroxyethyl, 2-hydroxyethyl or hydroxymethyl group in which at least one hydroxy group is esterfied by a C6? 30-alkanoic acid or etherified by an aliphatic C6? 30-alcohol and in which the other hydroxy group, if present, is free, esterified by a $C_{2\text{-}30}$-alkanoic acid or etherified by an aliphatic Cl? 30-alcohol, or W represents hydroxymethyl or a hydroxymethyl group that is esterified by a $C_{6\text{-}30}$-alkanoic acid or etherified by an aliphatic $C_{6\text{-}30}$-alcohol and Z represents a hydroxymethyl group that is esterified by a $C_{6\text{-}30}$-alkanoic acid or etherified by an aliphatic $C_{6\text{-}30}$-alcohol, or of a pharmaceutically acceptable salt of what compound is administered.

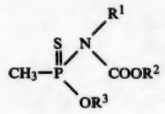
4,885,286

PHOSPHONAMIDOTHIONATE DERIVATIVES AND THEIR USE AS PESTICIDES

Hiromichi Yoshikawa, Fukuoka, and Teruyuki Misumi, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1988, Ser. No. 157,934
Int. Cl.[4] A01N *57/26*; C07F *9/32, 9/65*
U.S. Cl. 514—120 **12 Claims**

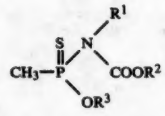
1. A phosphonamidothionate derivative represented by the formula



(I)

wherein R^1 and R^2 each independently represent a straight-chain alkyl group having 1 to 4 carbon atoms or a branched alkyl group having 3 or 4 carbon atoms and R^3 represents a phenyl group unsubstituted or substituted with a chlorine atom, a methyl group, a nitro group, a methylthio group or a nitrile group, an alkyl group having 1 to 4 carbon atoms or a 5-methyl-2-isoxazolyl group.

8. A method for combatting sanitary insect pests or agricultural and horticultural insect pests, which comprises applying to the insect pests or a habitat thereof a pesticidally effective amount of a phosphonamidothionate derivative represented by the formula



(I)

wherein R^1 and R^2 each independently represent a straight-chain alkyl group having 1 to 4 carbon atoms or a branched alkyl group having 3 or 4 carbon atoms and R^3 represents a phenyl group unsubstituted or substituted with a chlorine atom, a methyl group, a nitro group, a methylthio group or a nitrile group, an alkyl group having 1 to 4 carbon atoms or a 5-methyl-2-isoxazolyl group.

4,885,287

NOVEL METHOD OF ADMINISTERING ASPIRIN AND DOSAGE FORMS CONTAINING SAME

Anwar A. Hussain; Lewis W. Dittert, both of Lexington, and Thomas S. Foster, Nicholasville, all of Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Filed Aug. 9, 1988, Ser. No. 229,963
Int. Cl.[4] A61K *31/60*
U.S. Cl. 514—159 **24 Claims**

1. A method of inhibiting platelet aggregation and/or prostaglandin synthesis in a mammal in need of such treatment which comprises nasally administering thereto an effective platelet aggregation-inhibiting and/or prostaglandin synthesis-inhibiting amount of neutralized aspirin.

4,885,288

PHARMACEUTICAL COMPOSITIONS CONTAINING LYSINE ACETYLSALICYLATE

Lennette Benjamin, New York, N.Y., assignor to Synthelabo, Paris, France

Filed Oct. 2, 1987, Ser. No. 103,698
Claims priority, application France, Dec. 22, 1986, 86 17991
Int. Cl.[4] A61K *31/615*
U.S. Cl. 514—162 **1 Claim**

1. A process for the treatment of drepanocytosis comprising intravenously administering to a patient suffering from drepanocytosis a pharmaceutical composition comprising an effective amount of Lysine acetylsalicylate in combination with an intravenously administrable excipient, wherein said effective amount is effective for the amelioration of the symptoms of drepanocytosis.

4,885,289

ALTERATION OF CHARACTER OF MALE BEARD GROWTH

Miklos M. Breuer, 108 Ridge Ave., Newton, Mass. 02159; Edwin G. Kaszynski, 12928 Dean Rd., Wheaton, Md. 20902; Douglas Shander, 5 Meadowgrass Ct., Gaithersburg, Md. 20878; Vera R. Usdin, 6 Stevens Ct., Rockville, Md. 20850, and Hermes van der Lee, 4630 Thornhurst Dr., Olney, Md. 20832

Continuation-in-part of Ser. No. 560,726, Dec. 12, 1983, abandoned. This application Dec. 11, 1985, Ser. No. 807,623
Int. Cl.[4] A61K *31/56, 31/585*
U.S. Cl. 514—170 **26 Claims**

1. The process of reducing the rate and altering the character toward the vellus state of androgen-stimulated beard hair growth in intact, sexually mature males which comprises the step of applying to the skin a composition containing an effective amount of a material selected from the group consisting of 5-alpha-reductase inhibitors, cytoplasmic androgen receptor binding agents, and combinations thereof.

4,885,290

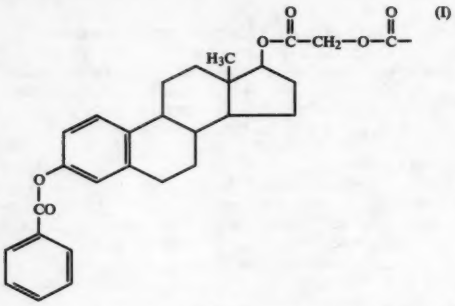
IMMUNOREGULATOR COMPRISING A DERIVATIVE OF ESTRADIOL

Kiro Asano, Kukizaki; Tadahiro Matsudaira, Tokyo; Humio Tamura, Kukizaki; Toichi Suzuki, Tokyo, and Hisayuki Wada, Matsudo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1987, Ser. No. 113,911
Claims priority, application Japan, Nov. 12, 1986, 61-268940
Int. Cl.[4] A61K *31/56*
U.S. Cl. 514—182 **7 Claims**

1. A method of treating a patient for the purpose of suppressing immuno response of the patient, which comprises administering to the patient a pharmaceutically effective amount to

suppress immuno response of said patient of an estradiol derivative represented by the formula (I):



(I)

4,885,291

1-CARBA(DETHIA)-3-CEPHEM DERIVATIVES

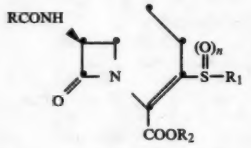
John H. McDonald, III, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 14, 1988, Ser. No. 143,793

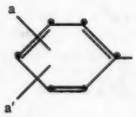
Int. Cl.[4] **C07D** *471/04, 417/12, 417/14;* **A61K** *31/435*

U.S. Cl. 514—210 **28 Claims**

1. The compound of the formula

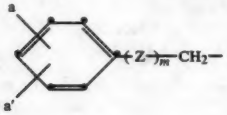


wherein R is hydrogen; C_1–C_6 alkyl; C_1–C_6 alkyl substituted by cyano, carboxy, halogen, amino, C_1–C_4 alkoxy, C_1–C_4 alkylthio, or trifluoromethylthio; phenyl or a substituted phenyl group of the formula



wherein a and a′ independently are hydrogen, halogen, hydroxy, C_1–C_4 alkoxy, C_1–C_4 alkanoyloxy, C_1–C_4 alkyl, C_1–C_4 alkylthio, amino, C_1–C_4 alkanoylamino, C_1–C_4 alkylsulfonylamino, carboxy, carbamoyl, aminosulfonyl, hydroxymethyl, aminomethyl, or carboxymethyl;

a group of the formula



wherein a and a′ have the same meanings as defined above, Z is O or S, and m is 0 or 1;

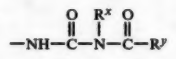
a heteroarylmethyl group of the formula

wherein R^1 is thienyl, furyl, benzothienyl, benzofuryl, pyridyl, 4-pyridylthio, pyrimidyl, pyridazinyl, indolyl, pyrazolyl, imidazolyl, triazolyl, tetrazolyl, oxazolyl, isoxazolyl, thiazolyl, oxadiazolyl, thiadiazolyl, and such heteroaryl groups substituted by amino, hydroxy, halogen, C_2–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylsulfonylamino;

a substituted methyl group of the formula

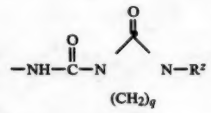
wherein R^2 is R^1 as defined above, cyclohex-1,4-dienyl, a phenyl group or substituted phenyl group of the formula

wherein a and a′ have the above defined meanings, and Q is hydroxy, C_1–C_4 alkanoyloxy, carboxy, sulfo, amino, sulfoamino, a substituted amino group of the formula

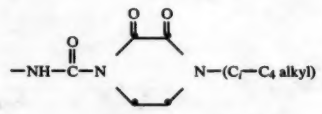


wherein R^x is hydrogen or C_1–C_3 alkyl, R^y is C_1–C_4 alkyl, furyl, thienyl, phenyl, halophenyl, nitrophenyl, styryl, halostyryl, nitrostyryl or a group

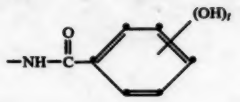
wherein R^x is hydrogen or C_1–C_3 alkyl, and R^z is hydrogen, C_1–C_3 alkylsulfonyl, C_1–C_3 alkyl, or C_1–C_4 alkanoyl; a substituted amino group of the formula



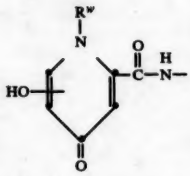
wherein R^Z has the same meanings as defined above and q is 2 or 3; a substituted amino group of the formula



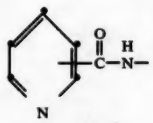
a benzamido group of the formula



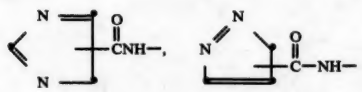
wherein t is 1 or 3; a pyridone or hydroxy-substituted pyridone group of the formula



wherein R^w is hydrogen or C_1–C_4 alkyl; a pyridyl group of the formula

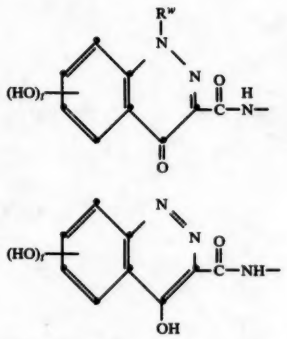


and such pyridyl group substituted by C_1–C_4 alkyl, amino, carboxy, hydroxy or halogen; an imidazoyl or pyrazolyl group of the formulae

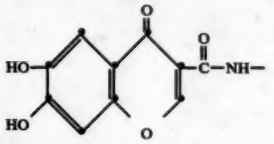


and such groups substituted by C_1–C_4 alkyl, carboxy, amino or halogen;

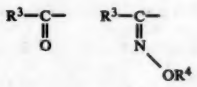
a benzypyridazin-4-one-3-ylcarbonylamino group of the formulae



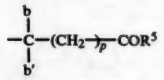
wherein R^z is hydrogen or C_1–C_4 alkyl; and t is 1–3; or Q is a substituted amino group of the formula



or R is a keto group or an oximino-substituted group of the formulae

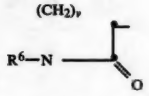


wherein R^3 is R^2 as defined above and R^4 is hydrogen; C_1–C_4 alkyl; C_1–C_4 alkyl substituted by halogen or amino; a substituted alkyl or cycloalkyl group of the formula



wherein b and b′ independently are hydrogen, or C_1–C_3 alkyl, p is 0, 1, 2, or 3; and b and b′ when taken together with the carbon to which they are bonded form a 3- to 6-membered carbocyclic ring, and R^5 is hydroxy, C_1–C_4 alkoxy, amino, C_1–C_4 alkylamino, or di(C_1–C_4 alkyl-)amino;

a cyclic lactam of the formula



wherein v is 2, 3, or 4; and R^6 is hydrogen or C_1–C_3 alkyl; or R^4 is a heteroarylmethyl group of the formula

wherein R^1 has the same meanings as defined hereinabove; n is 1 or 2;

R_1 is C_1–C_6 alkyl; C_1–C_6 alkyl substituted by hydroxy, C_1–C_4 alkoxy, C_1–C_4 alkylthio, trifluoromethyl, carboxy, carbamoyl, amino, C_1–C_4 alkylamino, di-(C_1–C_4 alkyl-)amino, halogen, cyano, phenyl, or substituted phenyl as defined above for R; C_2–C_6 alkenyl; C_3–C_7 cycloalkyl; phenyl or substituted phenyl as defined above for R; or a 5- or 6-membered heterocycle selected from thienyl, furyl, pyrryl, imidazolyl, pyrazolyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, oxadiazolyl, thiadiazolyl, triazolyl, tetrazolyl, pyridyl, pyrimidyl, triazinyl, or pyrazinyl; the benzheterocycles, benzothienyl, benzofuryl, indolyl, benzimidazolyl, or benztriazolyl, and said 5- or 6-membered heterocycle and said benzheterocycle substituted by C_1–C_4 alkyl, halogen, hydroxy, C_1–C_4 alkoxy, amino, carboxy, cyano, or carbamoyl; and when said heterocycle or benzheterocycle contains a basic ring nitrogen, the C_1–C_4 alkyl quaternary chloride, bromide or iodide salt thereof;

R_2 is hydrogen or a carboxy-protecting group, and, when R_2 is hydrogen, the pharmaceutically acceptable non-toxic salts thereof.

26. A method for treatment of bacterial infections in man and animals which comprises administering to said host an

antibacterially effective amount of a compound of claim 1 wherein R_2 is hydrogen or a pharmaceutically acceptable, non-toxic salt thereof.

4,885,292

N-HETEROCYCLIC ALCOHOL RENIN INHIBITORS

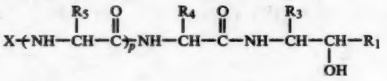
Denis E. Ryono, Princeton, and Harold N. Weller, III, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 3,446, Jan. 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 825,724, Feb. 3, 1986, abandoned. This application Jun. 29, 1989, Ser. No. 373,633

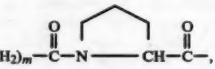
Int. Cl.[4] A61K *31/55*; C07D *413/12*

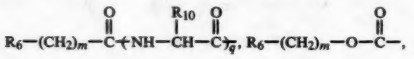
U.S. Cl. 514—211 42 Claims

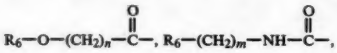
1. A compound of the formula

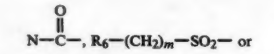


or a pharmaceutically acceptable salt thereof wherein:

X is $R_6-(CH_2)_m-$,  ,

 ,

 ,

 ,

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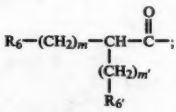
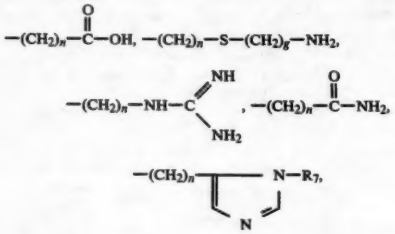
 ;

R_3, R_4, R_5 and R_{10} are independently selected from the group consisting of hydrogen, lower alkyl, halo substituted lower alkyl, $-(CH_2)_n-$aryl, $-(CH_2)_n-OH$, $-(CH_2)_n-O-$lower alkyl, $-(CH_2)_n-NH_2$, $-(CH_2)_n-SH$, $-(CH_2)_n-S-$lower alkyl, $-(CH_2)_n-O-(CH_2)_g-OH$, $-(CH_2)_n-O-(CH_2)_g-NH_2$, $-(CH_2)_n-S-(CH_2)_g-OH$,



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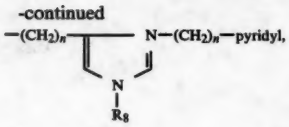


and $-(CH_2)_n-$cycloalkyl;

R_6 and R_6, are independently selected from the group consisting of lower alkyl, cycloalkyl, and aryl;

p is zero or one;

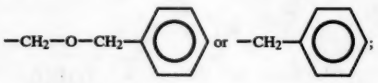
q is zero or one;

m and m' are independently selected from the group consisting of zero and an integer from 1 to 5;

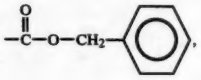
n is an integer from 1 to 5;

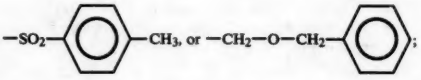
g is an integer from 2 to 5;

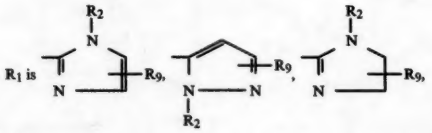
R_7 is

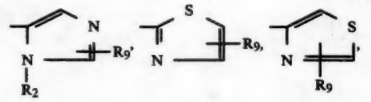
 ;

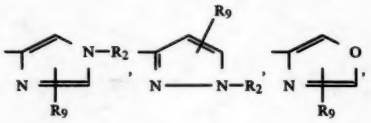
R_8 is 2,4-dinitrophenyl,

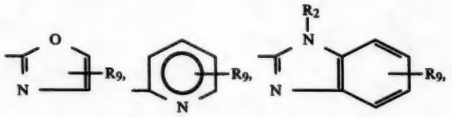
 ,

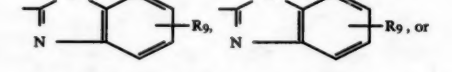
 ;

R_1 is  ,

 ,

 ,

 ,

 ,

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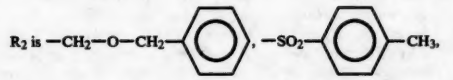
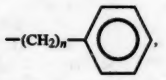
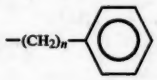


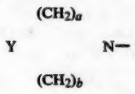
2,4-dinitrophenyl, hydrogen, lower alkyl,



or —$(CH_2)_n$—cycloalkyl;
R_9 is hydrogen, lower alkyl,



or -$(CH_2)_n$—cycloalkyl;
N- represents a heterocyclic ring of the formula



wherein Y is —CH_2, O, S, or N-R_9, a is an integer from 1 to 4, and b is an integer from 1 to 4 provided that the sum of a plus b is an integer from 2 to 5 and such heterocyclic rings wherein one carbon atom has a lower alkyl substituent;

the term aryl refers to phenyl, 1-naphthyl, 2-naphthyl, mono substututed phenyl, 1-naphthyl, or 2-naphthyl wherein said substituent is lower alkyl of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, halogen, hydroxy, amino, —NH-alkyl wherein alkyl is of 1 to 4 carbons, or —$N(alkyl)_2$ wherein alkyl is of 1 to 4 carbons, di or tri substituted phenyl, 1-naphthyl or 2-naphthyl wherein said substitutents are methyl, methoxy methylthio, halogen or hydroxy;

the term lower alkyl unless otherwise defined refers to straight or branched chain radicals having up to seven carbon atoms;

the term cycloalkyl refers to saturated rings of 4 to 7 carbon atoms;

the term halo refers to Cl, Br, and F; and

the term halo substituted lower alkyl refers to such lower alkyl groups in which one or more hydrogens have been replaced by chloro, bromo or fluoro groups.

34. A composition for treating hypertension in a mammalian species comprising a pharmaceutically acceptable carrier and an anti-hypertensively effective amount of a compound of claim **1**.

4,885,293

ANTIGLAUCOMA AGENTS

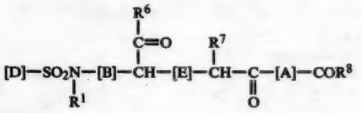
David R. Andrews, South Orange; Federico C. A. Gaeta, Rockaway Township, Morris County, and Robert W. Watkins, Great Meadows, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 784,000, Oct. 4, 1985, and a continuation-in-part of Ser. No. 721,015, Apr. 8, 1985, Pat. No. 4,634,698, which is a continuation-in-part of Ser. No. 653,186, Sep. 24, 1984, Pat. No. 4,556,655, said Ser. No. 784,000, is a continuation-in-part of Ser. No. 653,186,. This application Jul. 30, 1986, Ser. No. 892,003

Int. Cl.[4] A61K *37/00, 31/54, 279/00, 31/56*

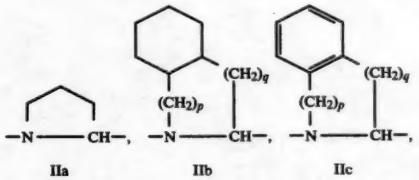
U.S. Cl. 514—223.2 **18 Claims**

1. A method for reducing intraocular pressure which comprises topically administering an intraocular pressure reducing effective amount of an ophthalmologically acceptable composition comprising a compound of the formula I:

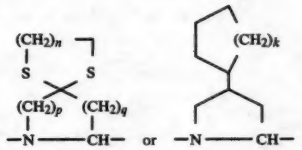


I

or a pharmaceutically acceptable salt thereof, wherein:
A is

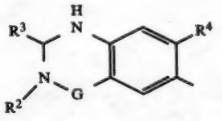


IIa IIb IIc



IId IIe

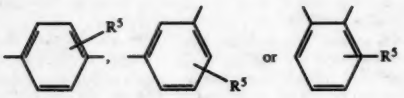
k is 1 or 2;
n is 0 or 1;
p and q are 0, 1 or 2, provided that in structures IIb and IIc the sum of p and q is 1 or 2, and that in formula IId, p is not 0;
B is -[J]-[L]-[M]-;
D is



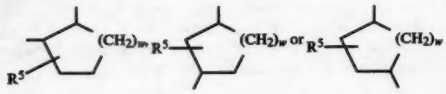
IIIa

E is —NH—, —O—, —S—, or —CH_2—;
G is —SO_2—;
J is —$(CH_2)_s$— or —$((CH_2)_r$—W)—;
L is a chemical bond, cis- or trans-lower alkenylene, lower alkynylene, -Z-aryl-, -aryl-Z-, -Z-cycloalkyl-, or -cycloalkyl-Z-, a 5- or 6-membered heterocyclic radical comprising 3–5

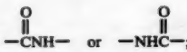
carbon atoms and 1 or 2 heteroatoms selected from N, O and S, or a R^5-substituted heterocyclic radical, wherein aryl is



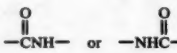
and cycloalkyl is



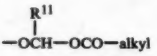
wherein
w is 1, 2 or 3;
M is $-(CH_2)_u-$ or $-((CH_2)_t-X-(CH_2)_v)-$;
W is



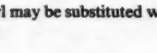
X and Z are independently a chemical bond, $-NR^9-$, $-O-$, $-S-$,



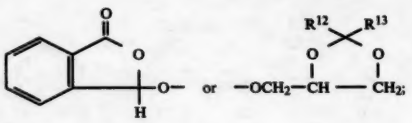
s, u and v are independently 0–5;
t is 1–5;
R^1, R^2 and R^9 are independently hydrogen, lower alkyl or lower acyl;
R^3 is hydrogen, lower alkyl, halo- and dihaloloweralkyl, trifluoroethylthiomethyl, phenylloweralkyl, (cycloalkyl)loweralkyl, aminomethyl, loweralkylaminomethyl, phenyl(lower)alkylaminomethyl, (cycloalkyl)loweralkylaminomethyl, loweralkylthiomethyl or haloloweralkylthiomethyl, 2-, 3- or 4-pyridyllower alkyl, 2-, 4- or 5-, thiazolyloweralkyl, 2-, 4- or 5-1H-imidazolylloweralkyl, 1-imidazolylloweralkyl, 1-morpholinoloweralkyl or hydroxyphenylloweralkyl;
R^4 is chlorine or CF_3;
R^5 is hydrogen, halogen, lower alkyl, lower acyl, lower alkoxy, haloloweralkyl or phenylloweralkyl;
R^7 is hydrogen, lower alkyl or aminoloweralkyl;
R^6 and R^8 are independently hydroxy, alkoxy having from 1 to 8 carbon atoms, benzyl, allyl, $R^{10}-O_r-(CH_2)_m-O-$, wherein Q is oxygen or sulfur, r is 0 or 1 and m is 2 to 4,



wherein the alkyl has from 3 to 8 carbon atoms,



wherein the phenyl may be substituted with group T defined below, 1-glyceryl,



R^{10} is phenyl, substituted phenyl wherein the substituents are chosen from group T, 1-naphthyl or 2-naphthyl;
T is halogen, hydroxy, trifluoromethyl, lower alkoxy, lower alkyl, 2-furanyl, 3-furanyl, 2-thienyl, 3-thienyl, phenyl and substituted phenyl wherein the substituents are chosen from halogen, hydroxy, trifluoromethyl, lower alkoxy or lower alkyl;
R^{11} is hydrogen or alkyl having from 1 to 8 carbon atoms;
R^{12} is hydrogen, lower alkyl, unsubstituted or substituted phenyl and substituted or unsubstituted phenyl lower alkyl, wherein phenyl may be substituted by group T; and
R^{13} is hydrogen or lower alkyl;
provided that if L is alkenylene or alkynylene, J is $-(CH_2)_s-$ wherein s is 1–5; provided that if L is -Z-aryl- or -Z-cycloalkyl-, J is $-(CH_2)_s-$ wherein s is 2–5; provided that if L is alkenylene, alkynylene, -aryl-Z- or -cycloalkyl-Z-, M is $-(CH_2)_u-$ wherein u is 1–5; provided that if s and u are each zero, L is aryl or cycloalkyl (i.e. Z is a bond); and provided that if s and v are each zero, L is aryl or cycloalkyl (i.e. Z is a bond); and
with the further provisos that, when D is of formula IIIb and R^1 is hydrogen, B is not $-(CH_2)_4-$; and that, when D is of formula IIIb and R^1 is hydrogen or lower alkyl, B is not $-(CH_2)_s-$aryl$-(CH_2)_t-X-(CH_2)_v-$wherein s is 0 or 1, t is 1, v is 0 to 2 and X is a bond, —O—, or —S—.

4,885,294

2-ARYL-3-(SUBSTITUTED PIPERAZINYL)-1-(1H-1,2,4-TRIAZOLYL)PROPANOL-2-OL ANTIFUNGAL AGENTS

Stephen J. Ray, Deal, and Kenneth Richardson, Birchington, both of England, assignors to Pfizer Inc., New York, N.Y.

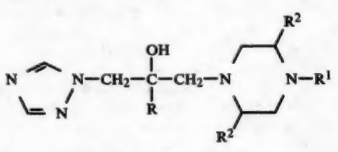
Filed Nov. 8, 1988, Ser. No. 268,821

Claims priority, application United Kingdom, Dec. 12, 1987, 8729083

Int. Cl.[4] **A01N** *43/60*; **C07D** *401/14, 413/14, 417/14*

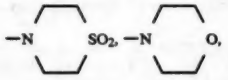
U.S. Cl. 514—227.8 **12 Claims**

1. A compound of the formula:



(I)

where
R is a phenyl or halo substituted phenyl;
R^1 is substituted phenyl wherein the substituent is —N=CH—N(C_1–C_4 alkyl)$_2$,



pyridyl, benzothiazolyl, benzoxazolyl or quinolyl; and
R^2 is H or CH_3; or a C_2–C_4 alkanoyl or benzoyl ester or a pharmaceutically acceptable salt thereof.

11. A method for treating fungal infections in a host suffer-

ing therefrom which comprises administering to said host an antifungally effective amount of a compound as claimed in claim 1.

4,885,295

METHOD OF USE OF 3-ARYLCARBONYL- AND 3-CYCLOALKYL-CARBONYL-1-AMINOALKYL-1H-INDOLES

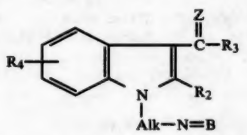
Malcolm R. Bell, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation of Ser. No. 928,335, Nov. 7, 1986, abandoned, which is a division of Ser. No. 810,942, Dec. 19, 1985, Pat. No. 4,634,776, which is a continuation of Ser. No. 755,239, Jul. 15, 1985, Pat. No. 4,581,354, which is a continuation-in-part of Ser. No. 637,931, Aug. 6, 1984, abandoned. This application Oct. 11, 1988, Ser. No. 255,305

Int. Cl.[4] A61K *31/40, 31/535*

U.S. Cl. 514—235.2 5 Claims

1. A method for the relief of pain or rheumatic or inflammatory conditions in a patient requiring such treatment which comprises administering orally or parenterally to such patient a medication in solid or liquid dosage form containing, as the active component thereof, an effective analgesic, anti-rheumatic or anti-inflammatory amount of a compound having the formula:



wherein:

R_2 is hydrogen, lower-alkyl, chloro, phenyl or benzyl (or phenyl or benzyl substituted by from one to two substituents selected from halo, lower-alkyl, lower-alkoxy, hydroxy, amino, lower-alkylmercapto, lower-alkylsulfinyl or lower-alkylsulfonyl);

R_3 is cyclohexyl, lower-alkoxycyclohexyl, phenyl (or phenyl substituted by from one to two substituents selected from halo, lower-alkoxy, hydroxy, benzyloxy, lower-alkyl, nitro, amino, lower-alkylamino, di-lower-alkylamino, lower-alkoxy-lower-alkylamino, lower-alkanoylamino, benzoylamino, trifluoroacetylamino, lower-alkylsulfonylamino, carbamylamino, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl, cyano, formyl or oximinomethylene), methylenedioxyphenyl, 3- or 4-hydroxy-1-piperidinylphenyl, 1-piperazinylphenyl, (1H-imidazol-1-yl)phenyl, (1-pyrrolyl)phenyl, aminomethylphenyl, guanidinylmethylphenyl, N-cyanoguanidinylmethylphenyl, styryl, lower-alkyl-substituted-styryl, fluoro-substituted-styryl, 2- or 4-biphenyl, 1- or 2-naphthyl (or 1- or 2-naphthyl substituted by from one to two substituents selected from lower-alkyl, lower-alkoxy, hydroxy, bromo, chloro, fluoro, lower-alkoxycarbonyl, carbamyl, cyano, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl or trifluoromethyl), thienyl, furyl, benzo[b]furyl, benzo[b]thienyl, quinolyl, or (N-lower-alkyl)pyrrolyl;

R_4 is hydrogen or from one to two substituents selected from lower-alkyl, hydroxy, lower-alkoxy or halo in the 4-, 5-, 6- or 7-positions;

C=Z is C=O or C=NOH;

Alk is α,ω-lower-alkylene having the formula $(CH_2)_n$ where n is an integer from 2 to 6, or such lower-alkylene substituted on the α- or the ω-carbon atom by a lower-alkyl group; and

N=B is azido, amino, N-lower-alkylamino, N,N-di-lower-alkylamino, N-(hydroxy-lower-alkyl)amino, N,N-di(hydroxy-lower-alkyl)amino, N-lower-alkyl-N-(hydroxy-lower-alkyl)amino, N-(lower-alkoxy-lower-alkyl)amino, N-(halo-n-propyl)amino, 4-morpholinyl, 2-lower-alkyl-4-morpholinyl, 2,6-di-lower-alkyl-4-morpholinyl, 4-thiomorpholinyl, 4-thiomorpholinyl-S-oxide, 4-thiomorpholinyl-S,S-dioxide, 1-piperidinyl, 3- or 4-hydroxy-1-piperidinyl, 3- or 4-lower-alkanoyloxy-1-piperidinyl, 3- or 4-amino-1-piperidinyl, 3-or 4-(N-lower-alkanoylamino)-1-piperidinyl, 2-cyclohexylmethyl-1-piperidinyl, 1-pyrrolidinyl, 3-hydroxy-1-pyrrolidinyl, 1-azetidinyl, 1-piperazinyl, 4-lower-alkyl-1-piperazinyl, 4-lower-alkanoyl-1-piperazinyl, 4-carbo-lower-alkoxy-1-piperazinyl, hexahydro-4H-1,4-diazepin-4-yl or the N=B N-oxides thereof; or an acid-addition salt thereof.

4,885,296

1-PIPERAZINYLPYRIMIDINE DERIVATIVES AND APPLICATION THEREOF IN THERAPEUTICS AND COSMETICS

Philippe Manoury, Verrières le Buisson, and Jean F. Grollier, Paris, both of France, assignors to L'Oreal, Paris, France

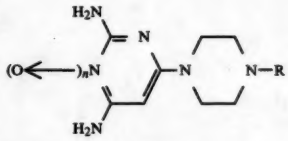
Filed Dec. 1, 1987, Ser. No. 126,799

Claims priority, application France, Dec. 1, 1986, 86 695

Int. Cl.[4] A61K *31/505;* C07D *403/04*

U.S. Cl. 514—252 6 Claims

1. Compounds corresponding to the formula (I):



(I)

in which R represents an alkoxycarbonyl group having from 1 to 3 carbon atoms in the alkoxy chain or represents a furoyl group, n is 0 or 1, and their acid addition salts.

3. Composition to be used for the treatment of the scalp and hair for inducing and stimulating hair growth and for decreasing hair loss containing an excipient and effective amount of a compound according to claim 1 or 2.

4,885,297

THIAZOLOPYRIDINE COMPOUNDS, PROCESSES FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Masaaki Matsuo, Toyonaka; Daizo Morino, Matsubara; Kiyoshi Tsuji, Kishiwada, and Hiroyuki Okumura, Ibaraki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

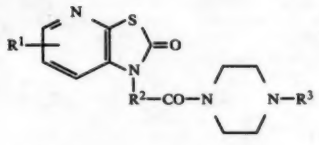
Filed Jun. 14, 1988, Ser. No. 206,297

Claims priority, application United Kingdom, Jun. 22, 1987, 8714596

Int. Cl.[4] A61K *31/495;* C07D *417/14*

U.S. Cl. 514—253 5 Claims

1. A compound of the formula:



wherein

R^1 is halogen,

R^2 is lower alkylene and

R^3 is lower alkyl, hydroxy(lower)alkyl, acyloxy(lower)alkyl or acyl(lower)alkyl, and

pharmaceutically acceptable salts thereof.

5. A method for the treatment of thrombosis in a human being or animal comprising administering an antithrombotically effective amount of a compound of claim 1 or pharmaceutically acceptable salt thereof.

4,885,298

PHARMACEUTICAL PREPARATIONS CONTAINING FLAVANONE OR THIOFLAVANONE DERIVATIVES THE USE THEREOF, NOVEL FLAVANONES AND THIOFLAVANONES, AND PROCESSES FOR THEIR MANUFACTURE

Christian G. Rimbault, Grand-Lancy, Switzerland, assignor to Zyma SA, Nyon, Switzerland

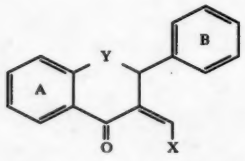
Continuation of Ser. No. 4,749, Jan. 8, 1987, abandoned, which is a continuation of Ser. No. 644,005, Aug. 24, 1984, abandoned. This application Aug. 2, 1988, Ser. No. 229,798

Claims priority, application United Kingdom, Aug. 31, 1983, 8323291

Int. Cl.[4] A61K *31/35, 31/38;* C07D *311/32, 335/06*

U.S. Cl. 514—253 27 Claims

27. A method of treating edema in a mammal in need thereof comprising administering to said mammal an antiedema effective amount of a compound of the formula



wherein

(a) X is lower alkyl; Y is oxygen, sulfur, sulfinyl, or sulfonyl; and rings A and B are independently unsubstituted or mono or di-substituted by hydroxy, halogen, lower alkyl, lower alkoxy, lower alkylamino, dilower alkylamino, lower alkanoylamino, carboxy, or lower alkoxycarbonyl; and

(b) X is phenyl substituted by lower alkanoylamino in the 2-or 3-position; Y is oxygen; and the rings A and B are independently unsubstituted or substituted by one or 2 substituents selected from hydroxy, lower alkoxy, lower alkylamino, dilower alkylamino, lower alkanoylamino, lower alkyl, halogen, carboxy, and lower alkoxycarbonyl; or a pharmaceutically acceptable salt thereof.

4,885,299

2-(2,3-DIHYDRO-2-OXO-3-BENZOFURANYL)ACETIC ACIDS ANTIHYPOXIC AND NOOTROPIC EFFECTS HAVING

Gilbert Lavielle, La Celle Saint-Cloud, and Jean Lepagnol, Chatou, both of France, assignors to ADIR Et Cie, Neuilly-sur-Seine, France

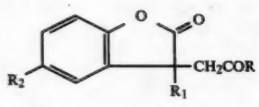
Division of Ser. No. 155,352, Feb. 12, 1988. This application Jan. 17, 1989, Ser. No. 298,107

Claims priority, application France, Feb. 27, 1987, 87 02630

Int. Cl.[4] A61K *31/495, 31/44;* C07D *401/14, 405/12*

U.S. Cl. 514—253 8 Claims

1. Compounds of general formula I



(I)

in which:

R_1 denotes a hydrogen atom, a linear or branched alkyl radical having 1 to 4 carbon atoms or a phenyl radical optionally substituted with a halogen atom or with an alkoxy radical having 1 to 4 carbon atoms or an alkyl radical having 1 to 4 carbon atoms,

R_2 denotes a hydrogen or halogen atom, a hydroxyl radical, an alkyl radical having 1 to 4 carbon atoms or an alkoxy radical containing 1 to 4 carbon atoms,

R denotes a radical of general formula A

(A)

in which x and y form, together with the nitrogen to which they are attached, a 1-piperazinyl radical (optionally substituted at the 4-position with a hydroxyalkyl radical having 1 to 4 carbon atoms, a carboxyalkyl radical having 2 to 5 carbon atoms, a benzyl radical optionally substituted with an alkyl radical having 1 to 4 carbon atoms, a 3,4-methylenedioxybenzyl radical, a phenyl radical optionally substituted with an alkyl radical having 1 to 4 carbon atoms or with a trifluoromethyl radical or with a halogen atom, or a 2-pyridyl radical optionally substituted with an alkyl radical having 1 to 4 carbon atoms or with a trifluoromethyl radical),

in racemic form or in the form of an optical isomer,

or an addition salt thereof with a pharmaceutically-acceptable inorganic or organic acid when it contains a salifiable basic group, or an addition salt thereof with a pharmaceutically-acceptable inorganic or organic base when it contains a salifiable acidic group.

4,885,300

4-SUBSTITUTED PYRAZOLO[3,4-D]PYRIMIDINE DERIVATIVES

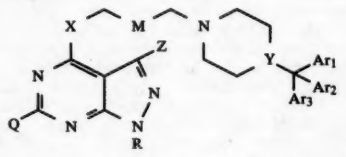
Jeffery B. Press, Rocky Hill, and Zoltan Hajos, Princeton, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Mar. 3, 1988, Ser. No. 163,488

Int. Cl.[4] C07D *487/04;* A61K *31/415*

U.S. Cl. 514—258 16 Claims

1. A compound of the formula



wherein X is selected from S, O;

M is selected from CH_2, CHOH, $CHOCOR_2$ and $CHOR_2$ wherein R_2 is selected from straight or branched chain C_1–C_8- lower alkyl, phenyl and substituted phenyl wherein the substituent is C_1–C_4- lower alkoxy, CF_3, halo and C_1–C_4- lower alkyl, NO_2 and CN;

Y is N, $N(CH_2)_n$ wherein n is 0–4, or a carbon atom having a double bond (C═) attached to the carbon atom to which Ar_1, Ar_2 and Ar_3 are attached; Ar_1, Ar_2 and Ar_3 are independently selected from hydrogen, C_1–C_4- lower alkyl, phenyl, substituted phenyl wherein the substituent is C_1–C_4- lower alkyl, C_1–C_4- lower alkoxy, CF_3, halo and perhalo, NO_2 and CN; naphthyl, pyridyl and thienyl;

Z is selected from H, CN, CO_2R_3 wherein R_3 is H or C_1–C_4- lower alkyl; C_1–C_4- lower alkyl, halogen and OH;

R is selected from H, C_1–C_4- lower alkyl; cyclopentyl, cyclohexyl, benzyl, C_2–C_6- lower alkenyl, C_2–C_6- lower alkynyl, tetrahydropyranyl and tetrahydrofuranyl;

Q is selected from halo, amino, C_1–C_4- lower alkyl and OH; and the optically active isomers thereof; provided that at

least one of Ar_1 Ar_2 and Ar_3 is aromatic and when Y is C═, only Ar_1 and Ar_2 are present.

4,885,301
PURINONE DERIVATIVES WHICH HAVE BRONCHODILATOR, VASODILATOR AND ANTI-ALLERGIC ACTIVITIES

William J. Coates, Welwyn Garden City, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

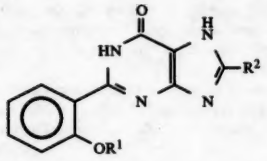
Filed Jan. 27, 1988, Ser. No. 148,791

Claims priority, application United Kingdom, Feb. 2, 1987, 8702300; Feb. 2, 1987, 8702301

Int. Cl.[4] A61K *31/52;* **C07D** *471/30*

U.S. Cl. 514—263 **21 Claims**

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein

R^1 is C_{1-6}alkyl or C_{2-6}alkenyl, and

R^2 is hydrogen or hydroxy.

19. A method for effecting bronchodilatation in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

20. A method for effecting vasodilatation in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

21. A method for effecting inhibition of a calmodulin insensitive cyclic GMP phosphodiesterase in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

4,885,302
2-((4-PIPERIDYL)METHYL)-1,2,3,4-TETRAHYDROISOQUINOLINE DERIVATIVES, THEIR PREPARATION AND THEIR APPLICATION IN THERAPY

Pascal George, 39 rue Henri de Vilmorin, 94400 Vitry-sur-Seine; Mireille Sevrin, 73, rue Raymond Losserand, 75014 Paris, and Christian Maloizel, 21, rue du Plateau, 92190 Meudon, all of France

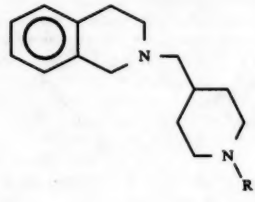
Filed Aug. 5, 1988, Ser. No. 228,748

Claims priority, application France, Aug. 7, 1987, 87 11288; Dec. 30, 1987, 87 18342; Apr. 19, 1988, 88 05129; Apr. 19, 1988, 88 05130

Int. Cl.[4] A61K *31/47;* **C07D** *401/06*

U.S. Cl. 514—307 **5 Claims**

1. A compound of formula (I)



(I)

in which R is

(a) a hydrogen atom;

(b) a linear or branched (C_1–C_6) alkyl group; an allyl group; a cycloalkylmethyl group in which the cycloalkyl moiety has from 3 to 6 carbon atoms; a phenylmethyl group unsubstituted or substituted with one to three substituents chosen from halogen atoms and trifluoromethyl, nitro, amino, dimethylamino, cyano, aminocarbonyl, linear or branched (C_1–C_3) alkyl, linear or branched (C_1–C_3) alkoxy and linear or branched (C_1–C_3) alkylthio groups; a 2-phenylethyl group; a 3-phenylpropyl group; a 3-phenyl-2-propenyl group; a phenylcarbonylmethyl group; a naphthylmethyl group; a pyridylmethyl group; a furylmethyl group; or a thienylmethyl group; or

(c) a linear or branched (C_2–C_6) alkanoyl group; a cycloalkylcarbonyl group in which the cycloalkyl moiety has from 3 to 6 carbon atoms; a trifluoroacetyl group; a phenylcarbonyl group unsubstituted or substituted with one to three substituents chosen from halogen atoms and trifluoromethyl, nitro, linear or branched (C_1–C_3) alkyl, linear or branched (C_1–C_3) alkoxy and linear or branched (C_1–C_3) alkylthio groups; a 1-oxo-3-phenyl-2-propenyl group; a naphthylcarbonyl group; a pyridylcarbonyl group; a furylcarbonyl group; a thienylcarbonyl group; a (2-indolyl)carbonyl group; or a (5-indolyl)carbonyl group; or a pharmacologically acceptable acid addition salt thereof.

5. A method of treatment of an anxiety state, which comprises administering, to a subject suffering or liable to suffer from said condition a compound as defined in claim 1.

4,885,303
CIRCULATION-ACTIVE TETRAHYDROPYRIDINE-3-CARBONITRILE DERIVATIVES

Horst Meyer, West aven, Conn.; Eckhard Schwenner, Wuppertal, and Andreas Knorr, Erkrath, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

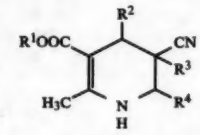
Filed Jan. 4, 1988, Ser. No. 141,363

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1987, 3700307

Int. Cl.[4] C07D *213/55, 213/57;* **A61K** *31/44*

U.S. Cl. 514—332 **10 Claims**

1. A tetrahydropyridine of the formula



in which

R^3 represents a group of the formula —CN or —$COOR^5$,

R^1 and R^5 each independently represents a straight-chain, branched or cyclic hydrocarbon radical which has up to 8 carbon atoms and can be interrupted in the chain by an oxygen atom and/or can be substituted by fluorine, cyano, acetoxy, hydroxyl, phenyl, phenoxy, or α-, β- or γ-pyridyl, or by an amino group, this amino group carrying two identical or different substituents from the group comprising alkyl with 1 or 2 carbon atoms and benzyl,

R^2 represents phenyl, naphthyl, thienyl or pyridyl, it being possible for the ring systems mentioned to be substituted by 1 or 2 identical or different substituents from the group comprising chlorine, trifluoromethyl, nitro and cyano, and

R^4 represents hydrogen, or represents phenyl, which can be substituted by nitro, fluorine, chlorine or trifluoromethyl, or a pharmaceutically acceptable acid addition salt thereof.

4,885,304

MITOMYCIN ANALOGS

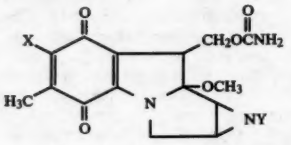
William A. Remers, Tucson, Ariz., assignor to University Patents, Inc., Westport, Conn.

Division of Ser. No. 206,529, Nov. 13, 1980, Pat. No. 4,460,599, which is a division of Ser. No. 100,331, Dec. 5, 1979, Pat. No. 4,268,676. This application Jul. 11, 1984, Ser. No. 629,814

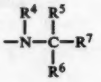
Int. Cl.[4] A61K *31/44, 31/40*

U.S. Cl. 514—338 4 Claims

1. A method for treatment of a neoplastic disease state in an animal comprising administering to an animal having such a disease a therapeutically effective amount of a compound of the formula,



wherein: Z is selected from the group consisting of: a pyridylamino; or the formula,



in which R^4, R^5, and R^6 are the same or different and selected from the group consisting of hydrogen or lower alkyl and R^7 is halo lower alkyl.

4,885,305

NASAL COMPOSITIONS

Jean-René Kiechel, Rueil-Malmaison; Francoise Acezat-Mispelter, Elancourt, and Danielle Plas, Rueil-Malmaison, all of France, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 127,817, Dec. 2, 1987, abandoned, which is a continuation of Ser. No. 764,866, Aug. 12, 1985, abandoned. This application Jan. 5, 1989, Ser. No. 294,902

Claims priority, application France, Aug. 10, 1984, 84 12668

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—356 10 Claims

1. A method of treating a host to alleviate cardiac and cerebral disorders which comprises administering to said host through the nasal mucous membrane a pharmaceutical composition containing in single dose form from about 0.5 to about 20 mg. of nicardipine or nicardipine hydrochloride and a pharmaceutically acceptable nasal carrier.

4,885,306

DERIVATIVES OF 1-ARYLSULPHONYL-2-OXO-5-ALKOXY-PYRROLIDINE AND MEDICAL COMPOSITIONS CONTAINING THEM

Emilio Toja; Carlo Gorini, both of Milan; Fernando Barzaghi, and Giulio Galliani, both of Monza, all of Italy, assignors to Roussel Uclaf, Paris, France

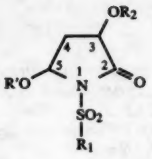
Filed Jun. 2, 1988, Ser. No. 203,740

Claims priority, application Italy, Jun. 5, 1987, 20809 A/87

Int. Cl.[4] C07D *207/38;* A61K *31/40*

U.S. Cl. 514—425 10 Claims

1. Compounds with the general formula (I):



(I)

in which R′ represents hydrogen, or alkyl containing up to 8 carbon atoms, R_1 represents phenyl possibly substituted by one or more substituents selected from the group consisting of a free, esterified or etherified hydroxyl radical in which the ester or ether part contains from 1 to 18 carbon atoms, the ketone and oxime functions, a linear, branched or cyclic, alkyl or alkenyl, having up to 18 carbon atoms, halogen, CF_3, SCF_3, OCF_3, NO_2, NH_2, C≡N, phenyl and alkylsulphonyl having from 1 to 6 carbon atoms, and R_2 represents hydrogen or linear, branched or cyclic alkyl containing up to 4 carbon atoms.

7. A therapeutic composition comprising a therapeutically effective amount of a compound as defined in any one of claims 1, 2, or 5, and a pharmaceutically acceptable carrier.

4,885,307

DERIVATIVES OF 1-ARYLSULPHONYL-1,5-DIHYDRO-2H-PYRROL-2-ONE, AND COMPOSITIONS CONTAINING THEM

Emilio Toja; Carlo Gorini, both of Milan; Fernando Barzaghi, and Giulio Galliani, both of Monza, all of Italy, assignors to Roussel Uclaf, Paris, France

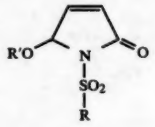
Filed Jun. 13, 1988, Ser. No. 205,958

Claims priority, application Italy, Jun. 24, 1987, 21029 A/87

Int. Cl.[4] C07D *207/38;* D61K *31/40*

U.S. Cl. 514—425 7 Claims

1. Compounds of the formula (I):



(I)

in which R′ represents hydrogen, a linear, branched or cyclic alkyl containing up to 8 carbon atoms, alkenyl containing from 2 to 8 carbon atoms, acetyl, propionyl, butyryl or aralkyl containing from 7 to 15 carbon atoms and R represents phenyl, possibly substituted by the free, esterified or etherified hydroxy radical in which the ester or ether part has from 1 to 18 carbon atoms, the ketone and oxime functions, linear, branched or cyclic, alkyl or alkenyl having up to 18 carbon atoms, halogen, CF_3, SCF_3, OCF_3, NO_2, NH_2, C≡N, phenyl or alkoxycarbonyl containing from 2 to 8 carbon atoms and alkylsulphonyl containing 1 to 6 carbon atoms.

6. A therapeutic composition comprising a therapeutically effective amount of a compound as defined in any one of claims 1, 2, 4 or 5, and a pharmaceutically acceptable carrier.

4,885,308

METHOD AND COMPOSITIONS FOR TREATMENT OF PARKINSONISM SYNDROME IN MAMMALS

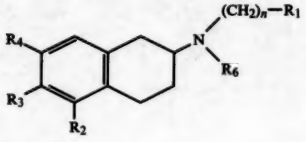
Alan S. Horn, Groningen, Netherlands, assignor to Nelson Research & Development Co., Irvine, Calif.

Continuation-in-part of Ser. No. 640,685, Aug. 13, 1984, Pat. No. 4,564,628, and a continuation-in-part of Ser. No. 811,768, Dec. 20, 1985, Pat. No. 4,657,925. This application Jun. 13, 1988, Ser. No. 206,193

Int. Cl.[4] A61K *31/38*

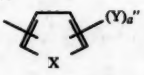
U.S. Cl. 514—438 37 Claims

1. A method for treating the symptoms of parkinsonism in a mammal comprising administering to said mammal an effective amount of one or more compounds selected from the group consisting of the optically active or racemic compounds wherein the amount of the negative isomer is an amount effective to treat parkinsonism said compounds being represented by the formula:



wherein

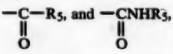
R_1 is



X is sulfur,

Y is hydroxy, and a is an integer of from zero to 3,

R_3, R_5 and R_4 are each selected from the group consisting of H and OA, A is H or is selected from the group consisting of hydrocarbyl radicals,



R_5 is selected from the group consisting of hydrocarbyl radicals; n is an integer between 1 and 3; and R_6 is an alkyl chain having between 1 and 3 carbon atoms with the provision that at least one of R_2, R_3 and R_4 is H, that at least one of R_2, R_3 and R_4 is not H, and that R_2 and R_4 are not both OA, and pharmaceutically acceptable salts thereof.

4,885,309

THERAPEUTIC TREATMENT OF LEUKOTRIENE-MEDIATED DERMAL INFLAMMATION BY TOPICAL ADMINISTRATION OF 3,4-DIHYDRO-2H-1-BENZOPYRAN DERIVATIVES

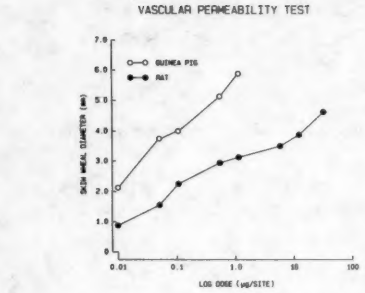
Ann F. Welton, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

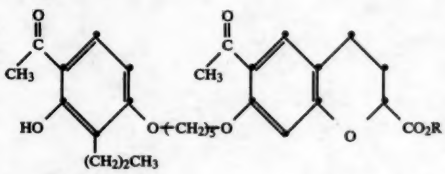
Filed Aug. 1, 1986, Ser. No. 893,076

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—456 9 Claims

1. A method for treating leukotriene-mediated dermal inflammation, which comprises topically administering to the affected area an effective anti-inflammatory amount of a compound of the formula





in which R is hydrogen or lower alkyl, an enantiomer thereof, or when R is hydrogen, a salt hereof.

4,885,310

ANTI-FUNGAL METHODS AND AGENT

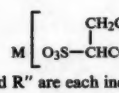
Gerald N. Kern, 4631 Louis Ave., Encino, Calif. 91316, assignor to Gerald N. Kern, Encino, Calif.

Filed May 9, 1985, Ser. No. 732,876

Int. Cl.[4] A61K *31/225*

U.S. Cl. 514—547 26 Claims

1. A method for treating fungal infections of animals and humans comprising administering to an animal or human having a fungal infection an effective anti-fungal dosage of a compound of the following formula:



ps wherein R' and R" are each independently a straight chain or branched chain alkyl group of from 5 to 8 carbon atoms, M is Na, Ca or K, and x is 1 when M is Na or K, and x is 2 when M is Ca.

4,885,311

TOPICAL TRANSRETINOIDS FOR TREATMENT OF ACNE AND SKIN DISEASES

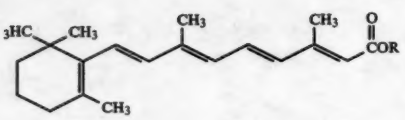
Harlie A. Parish, and William P. Purcell, both of Memphis, Tenn., assignors to Molecular Design International, Memphis, Tenn.

Filed Jun. 29, 1987, Ser. No. 67,536

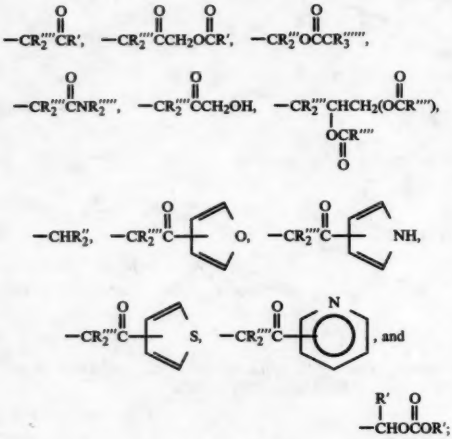
Int. Cl.[4] A61K *31/23;* C11C *3/02;* C07D *213/46, 307/02*

U.S. Cl. 514—549 14 Claims

1. A compound of the formula:

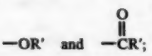


wherein R is a member of the group consisting of:



wherein R′ is a member of the group consisting of H and lower alkyls ranging from C_1 to C_6;

wherein R″ is a member of the group consisting of



wherein R‴ is the hydrocarbon backbone of fatty acids;

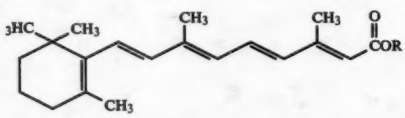
wherein R⁗ is a member of the group consisting of R′ and the hydrocarbon backbone of fatty acids;

wherein R⁗′ is the lower alkyls ranging from C_1 to C_6; and further,

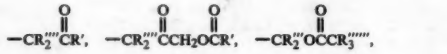
where there are two or more R′, R″, R‴, R⁗, or R⁗′ groups attached to the same carbon, each R′, R″, R‴, R⁗, or R⁗′ group may be the same as or different from the other R′, R″, R‴, R⁗, or R⁗′ groups attached to said carbon.

3. A pharmaceutical composition for the treatment of acne which comprises:

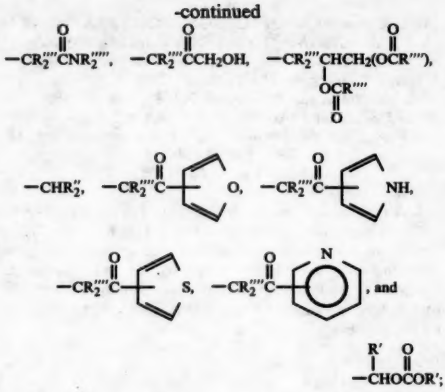
an effective acne-treatment amount of an acne-treating compound of the formula:



wherein R is a member of the group consisting of:

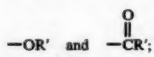


-continued



wherein R′ is a member of the group consisting of H and lower alkyls ranging from C_1 to C_6;

wherein R″ is a member of the group consisting of



wherein R‴ is the hydrocarbon backbone of fatty acids;

wherein R⁗ is a member of the group consisting of R′ and the hydrocarbon backbone of fatty acids;

wherein R⁗′ is the lower alkyls ranging from C_1 to C_6; and further,

where there are two or more R′, R″, R‴, R⁗, or R⁗′ groups attached to the same carbon, each R′, R″, R‴, R⁗, or R⁗′ group may be the same as or different from the other R′, R″, R‴, R⁗, or R⁗′ groups attached to said carbon;

admixed with a pharmaceutically-acceptable vehicle.

4,885,312

METHOD FOR ENHANCING THE EFFECT OF INDIRECT-ACTING SYMPATHOMIMETIC AMINES

Richard J. Wurtman, Boston, and Timothy J. Maher, Milton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 845,141, Mar. 27, 1986, Pat. No. 4,673,689, which is a division of Ser. No. 780,054, Sep. 25, 1985, Pat. No. 4,598,094. This application Dec. 29, 1986, Ser. No. 947,208

Int. Cl.[4] A61K *31/195*

U.S. Cl. 514—561 **5 Claims**

1. The process for preventing tachyphylaxis of an indirect acting sympathomimetic amine drug selected from the group consisting of metaraminol, pseudoephedrine and methoxyphenamine which comprises administering to a patient concomitantly with said drug, a catecholamine precursor selected from the group consisting of tyrosine, a tyrosine precursor or a mixture of tyrosine and a tyrosine precursor to obtain a tyrosine blood plasma concentration between about 15 and about 100 μg/ml.

4,885,313

3,4-DIHYDROXYPHENYLETHYLAMINE DERIVATIVES AND THEIR USE

John Dixon, Melton Mowbray, and Francis Ince, Loughborough, both of United Kingdom, assignors to Fisons plc, Loughborough, England

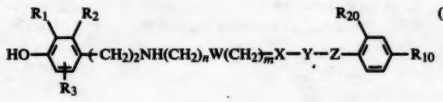
Division of Ser. No. 662,393, Oct. 18, 1984, Pat. No. 4,720,586. This application Dec. 2, 1987, Ser. No. 127,365

Claims priority, application United Kingdom, Dec. 6, 1983, 8332447; Dec. 6, 1983, 8332448; Dec. 6, 1983, 8332452; Jan. 24, 1984, 8401746; Jan. 24, 1984, 8401747; Jan. 24, 1984, 8401748; Jan. 24, 1984, 8401750

Int. Cl.[4] C07C *103/22*

U.S. Cl. 514—620 9 Claims

1. A compound of formula I,



(I)

in which

R_1 represents OH,

R_2 and R_3, which may be the same or different, each independently represent hydrogen, fluorine, chlorine, bromine, alkyl C1 to 6, nitro, $(CH_2)_pR_9$ or SR_9,

W represents a single bond, a 1,2-,1,3-, or 1,4-phenylene ring; a —CH=CH— group or a 1,4-cyclohexanediyl group;

Z represents a single bond, NR_{19}, or CH_2, in which R_{19} represents hydrogen or alkyl C1 to 6;

n and m each independently represent an integer from 1 to 4 inclusive; p1 p represents 0 or an integer from 1 to 3 inclusive;

R_9 represents phenyl or phenyl substituted by hydroxy,

R_{10} represents hydrogen or chlorine, and

X represents NH, Y represents CO, and R_{20} represents hydrogen

or X represents CONH, Y represents $(CH_2)q$, wherein q represents an integer from 1 to 3 inclusive, and R_{20} represents hydrogen,

and pharmaceutically acceptable derivatives thereof.

9. A method of treatment of a cardiac disorder, which method comprises administration to a patient suffering from such a condition of a therapeutically useful amount of a compound in accordance with claim 1.

4,885,314

NOVEL HMG-COA REDUCTASE INHIBITORS

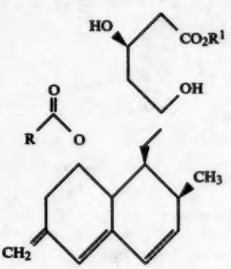
Kamlesh P. Vyas, Harleysville, and Hanumath P. Kari, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 67,503, Jun. 29, 1987, Pat. No. 4,782,084. This application Sep. 1, 1988, Ser. No. 239,238

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—630 6 Claims

1. A compound represented by the following general structural formula (II):



(II)

wherein:

R is C_{1-10} alkyl; and

R^1 is hydrogen, C_{1-5} alkyl or C_{1-5} alkyl substituted with a member of the group consisting of phenyl, dimethylamino or acetylamino or a pharmaceutically acceptable salt of the compound (II) in which R^1 is hydrogen.

4,885,315

FOAMABLE THERMOPLASTIC POLYMERS AND A METHOD FOR FOAMING

Tu-Anh Pham, Lake Jackson, and Gerald M. Lancaster, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 47,071, May 4, 1987, Pat. No. 4,853,420. This application Sep. 7, 1988, Ser. No. 241,523

Int. Cl.[4] C08J *9/00*

U.S. Cl. 521—50.5 23 Claims

1. A method for foaming thermoplastic polymers which method comprises

(A) imbibing or impregnating a polymer composition comprising

(1) from about 10 to about 100 percent by weight of at least one thermoplastic polymer which is heatable when subjected to high frequency electromagnetic radiation, which polymer contains in its backbone, some carbon atoms which have attached thereto a member selected from the group consisting of =O, —Cl, —OH, —OCH_3, —OC_2H_5, —O—CO—CH_3, and —O—CO—C_2H_5: which groups are present in an amount sufficient to render the polymer heatable by high frequency electromagnetic radiation: and

(2) from about zero to about 90 percent by weight of at least one thermoplastic polymer which is not heatable when subjected to high frequency electromagnetic radiation;

with a sufficient quantity of a mechanical or physical foaming or blowing agent to cause expansion of the polymer when subjected to the treatment of step (B); and

(B) subjecting the resultant imbibed or impregnated polymer composition to a sufficient amount of high frequency electromagnetic radiation to cause foaming.

4,885,316

SUBSTITUTED 5-AMIDOTETRAZOLES AS BLOWING AGENTS IN THE PRODUCTION OF CELLULAR THERMOPLASTIC OR RUBBER MATERIALS

Eugene F. Rothgery, North Branford, and Steven A. Manke, Wallingford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

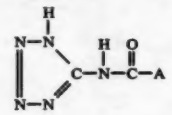
Division of Ser. No. 70,454, Jul. 6, 1987. This application Nov. 28, 1988, Ser. No. 276,585

Int. Cl.[4] C08J *9/10*; C07D *257/06*

U.S. Cl. 521—90 13 Claims

1. In a process for the production of cellular products comprising mixing rubber or a thermoplastic material with a blow-

ing agent, the improvement which comprises using as blowing agent a tetrazole compound having the formula:



(I)

wherein

A represents NHX, NRR' or OR

X represents H or a lower alkyl group,

R represents a lower alkyl group, and

R' represents a lower alkyl group.

4,885,317

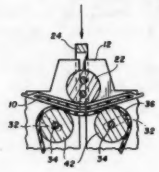
PRESS FORMING PROCESS AND APPARATUS FOR PLASTIC FOAM AND PLASTIC FOAM PRODUCT

Joe K. Thein, Torrance, and Flerida B. Uldrich, Westminster, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Jul. 21, 1988, Ser. No. 222,651

Int. Cl.[4] B29C *67/22, 51/08, 53/04*

U.S. Cl. 521—149 **5 Claims**



1. A method of press-forming an article of required shape from a flat workpiece of thermoplastic foam material comprising the steps of:

providing a heat retaining envelope having upper and lower skins,

said upper skin being contractive without wrinkling,

said lower skin being expansive without wrinkling,

enclosing said workpiece within said heat-retaining envelope,

heating said envelope workpiece to temperature;

transferring said heated enveloped workpiece to an unheated forming press adapted to form said workpiece to the required shape before it cools below its forming temperature,

actuating said forming press to shape the enveloped article and holding said workpiece formed therein until it cools and hardens as the article of required shape without wrinkles,

removing the enveloped article from said press, and

removing said article from said envelope.

3. The article resulting from the method of claim 1.

4,885,318

POLYKETONE FLAME RETARDANT COMPOSITION

Richard L. Danforth, Missouri City, and Darlene G. Smith, Bellville, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 31, 1989, Ser. No. 332,636

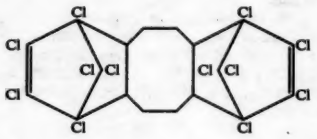
Int. Cl.[4] C08K *5/02, 5/06, 5/13*

U.S. Cl. 524—281 **21 Claims**

1. A flame retardant polymer composition comprising a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and a flame retarding quantity of a flame retardant selected from the group consisting of:

(a) antimony oxide and decabromodiphenyl oxide;

(b) antimony oxide and a chlorine compound selected from the group consisting of perchloropentacyclodecane, the adduct



or mixtures thereof; or

(c) a bromine compound selected from the group consisting of tetrabromobisphenol A, a tetrabromobisphenol A carbonate oligomer or an ether derivative of tetrabromobisphenol A.

4,885,319

SOLVENT RESISTANT IRRADIATION CURABLE COATINGS

James A. Dougherty, Pequannock, and Fulvio J. Vara, Chester, both of N.J., assignors to GAF Corporation, Wayne, N.J.

Division of Ser. No. 161,512, Feb. 29, 1988, abandoned. This application Dec. 12, 1988, Ser. No. 282,527

Int. Cl.[4] C08F *283/10, 2/50*

U.S. Cl. 522—31 **11 Claims**

1. The composition containing the blend of (a) between about 65 wt. % and about 35 wt. % of a hydrophobic divinyl ether containing from 6 to 30 carbon atoms and having a Tg of from about 20° to about 150° C. and (b) between about 35 wt. % and about 65 wt. % of a hydrophilic polyethylene glycol divinyl ether which blend is mixed with between about 10 wt. % and about 70 wt. %, based on total composition, of an irradiation curable epoxy resin having a molecular weight of from about 300 to about 5,000.

4,885,320

POLYMERIC OPAQUE PARTICLES AND PROCESS FOR MAKING SAME

John Biale, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 117,681, Nov. 5, 1987, Pat. No. 4,829,102. This application Nov. 30, 1988, Ser. No. 278,050

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] C08F *267/06;* **C08L** *51/00*

U.S. Cl. 523—201 **53 Claims**

1. Water-insoluble opacifying particles comprising polymerized core particles comprises of a polymer having pendant functional groups of the form:

wherein A is an organic bridge at least 5 atoms long and R_3 is hydrogen or an organic radical, said core particles being encapsulated with a sheath polymer comprised of one or more ethylenically unsaturated nonionic monomers, said particles being substantially free of microvoids.

4,885,321

POLYARYLENE SULFIDE RESIN COMPOSITION AND MOLDED ARTICLE FOR LIGHT REFLECTION

Toshikatsu Nitoh, and Kazutomo Tokushige, both of Fuji, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Apr. 24, 1989, Ser. No. 341,975
Claims priority, application Japan, Apr. 25, 1988, 63-102093
Int. Cl.[4] C08J 9/32
U.S. Cl. 523—219 12 Claims

1. A polyarylene sulfide resin composition consisting essentially of:

(A) a polyarylene sulfide resin and

(B) 5 to 400% by weight based on said polyarylene sulfide resin of a hollow microspherical filler which comprises 20 to 80% by weight of SiO_2 and 20 to 80% by weight of Al_2O_3 as major components and has a specific gravity of 1.0 to 2.5 and an average particle diameter of 1 to 100 μm.

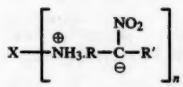
4,885,322

NOVEL AMMONIUM SALT USEFUL AS MODIFIERS FOR RUBBER

Isao Kurimoto, Toyonaka; Hiroki Yamamoto, Nishinomiya, and Tetsuo Yamaguchi, Hirakata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 19, 1988, Ser. No. 196,057
Claims priority, application Japan, Sep. 22, 1987, 62-238190
Int. Cl.[4] L08K 5/19
U.S. Cl. 524—82 14 Claims

1. A rubber composition comprising rubber and an ammonium salt represented by the formula:



wherein X is aliphatic or alicyclic, each of which may contain halogen, oxygen, nitrogen or sulfur in the group; n is an integer of 1 or more; and R and R' each independently represent hydrogen or alkyl having I to 12 carbon atoms, and may conjointly form a ring.

4,885,323

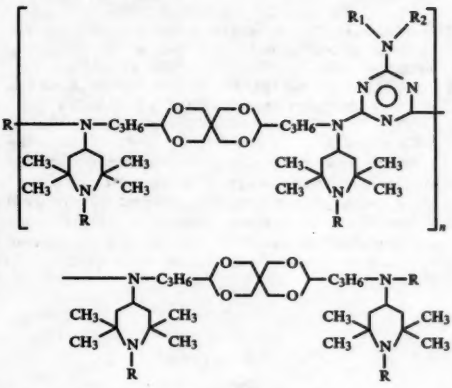
POLY-2,2,6,6-TETRAMETHYL PIPERIDYL AMINO SPIRO GLYCOL ETHER-1,3,5-TRIAZINES

Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Okegawa; Toshihiro Shibata, Omiya, and Etsuo Tobita, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Division of Ser. No. 902,380, Sep. 2, 1986, Pat. No. 4,743,688. This application Dec. 28, 1987, Ser. No. 138,750
Claims priority, application Japan, Aug. 30, 1985, 60-191279
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—95 40 Claims

1. A polyvinyl chloride resin composition having improved resistance to deterioration upon exposure to light comprising a polyvinyl chloride resin formed at least in part of the recurring group:

and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and a poly-2,2,6,6-tetramethyl piperidyl amino spiro glycol ether-1,3,5-triazine having the formula:



in which:

R is selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms, hydroxyalkyl having from two to about six carbon atoms; epoxyalkyl having from three to about eight carbon atoms; alkaryl having from seven to about eighteen carbon atoms; acyl having from two to about eight carbon atoms; and oxyl;

each of R_1 and R_2 is selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms; hydroxyalkyl having from two to about six carbon atoms; alkoxyalkyl having from three to about eight carbon atoms; dialkylaminoalkyl having up to ten carbon atoms; aryl and alkylaryl having from six to about twenty-four carbon atoms; and alkylene forming a heterocyclic ring including the nitrogen atom in the ring and having from four to seven carbon atoms and no or one oxygen atoms; and

n is a number from 2 to about 40 representing the average number of units enclosed by the brackets.

4,885,324

COMBINATION PRIMER/TOPCOAT COATING

Charles R. Hegedus, Warrington, Pa., and William J. Green, Clementon, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 211,026, Jun. 16, 1988, abandoned. This application Mar. 28, 1989, Ser. No. 331,200
Int. Cl.[4] C08L 75/04
U.S. Cl. 524—204 26 Claims

1. A coating for metallic or polymeric composite surfaces which performs as both a primer and a topcoat, comprising:

a polyurethane binder formed by the reaction between an aliphatic polyester polyol and hexamethylene diisocyanate;

pigments for providing opacity and strength consisting essentially of titanium dioxide spherical particles and titanium dioxide vesiculated beads; and

pigments for providing corrosion prevention consisting essentially of zinc phosphate, zinc salt of a substituted benzoic acid, and zinc molybdate.

4,885,325

WATER DISPERSIBLE QUATERNIZED AMINOAMIDE-MODIFIED WAXES USEFUL AS TEXTILE FINISHING AGENTS

Bernard Danner, Riedisheim, France, and Eckart Schleusener, Reinach, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 884,164, Jul. 10, 1986, Pat. No. 4,743,660.
This application Apr. 26, 1988, Ser. No. 186,280
Int. Cl.[4] C08K 5/17
U.S. Cl. 524—236 19 Claims

1. A composition comprising (a_1) a quaternized aminoamide obtainable by amidating, with a polyamine containing a single primary amino group, a carboxy group-containing oxidized hydrocarbon wax which is non-saponified or partially saponified, and quaternizing at least one amino group of the resulting aminoamide-modified wax and (b) a dispersing agent.

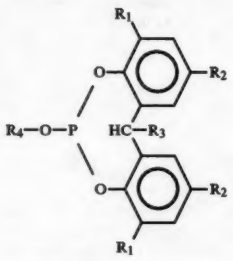
4,885,326

COMPOSITION OF STABILIZED SYNTHETIC RESIN

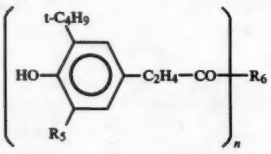
Tohru Haruna, Okegawa; Kazunori Nishikawa, Matsudo, and Mitsuhiro Hamajima, Kashiwa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1989, Ser. No. 328,313
Claims priority, application Japan, Apr. 2, 1988, 62-81866
Int. Cl.[4] C08K 5/52
U.S. Cl. 524—291 1 Claim

1. A stabilized composition of a synthetic resin which comprises 100 parts by weight of a synthetic resin, 0.001 to 10 parts by weight of a cyclic alkylphosphite compound of 2,2'-alkylidene-bisphenol (I) having the formula (I) and 0.001 to 10 parts by weight of beta-(3,5-dialkyl-4-hydroxyphenyl)-propionic acid ester (II) having the formula (II):



(I)



(II)

in which R1 is tertiary-butyl or tertiary-amyl, R2 is an alkyl having 1 to 9 carbon atoms, R3 is hydrogen or an alkyl having 1 to 4 carbon atoms, R4 is an alkyl having 1 to 30 carbon atoms, R5 is an alkyl having 1 to 4 carbon atoms, R6 is a residual group of a monohydric alcohol, a dihydric alcohol, a trihydric alcohol or a tetrahydric alcohol and n is a number of 1 to 4.

4,885,327

SWELLED POLYMERIC DECONTAMINATION COMPOSITION

William A. McMahon, Jr.; David A. Trujillo, and Robert E. Lyle, Jr., all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Nov. 18, 1987, Ser. No. 122,103
Int. Cl.[4] C08K 5/06
U.S. Cl. 524—376 10 Claims

1. A polymeric decontamination composition consisting essentially of a swelled polymeric reaction product consisting of the reaction product of a polyvinylbenzyl halide and a monomeric amine admixed with an alkali metal hydroxide solution capable of swelling said polymeric reaction product.

4,885,328

FLAME RETARDANT COMPOSITIONS

Richard L. Danforth, Missouri City, and Darlene G. Smith, Bellville, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 31, 1989, Ser. No. 332,250
Int. Cl.[4] C08K 3/22
U.S. Cl. 525—424 26 Claims

1. A flame retardant polymer composition comprising a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and a flame retarding quantity of an alkaline earth metal hydroxide.

15. A flame retardant composition comprising:

(a) about 50 to about 85 percent by weight of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon;

(b) about 5 to about 30 percent by weight of an alkaline earth metal hydroxide; and

(c) about 5 to about 20 percent by weight of an alkaline earth metal carbonate, wherein the weight ratio of said alkaline earth metal hydroxide to said alkaline earth metal carbonate is 1:1 or greater.

4,885,329

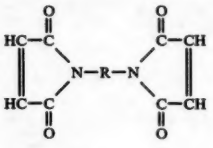
POLYIMIDE RESIN COMPOSITIONS

Kaoru Tominaga; Kojiro Kan; Toshimasa Takata, and Toru Tomoshige, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,529
Claims priority, application Japan, Apr. 14, 1987, 62-89692; May 29, 1987, 62-131398
Int. Cl.[4] C08K 3/18
U.S. Cl. 524—430 5 Claims

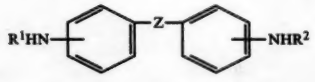
1. A polyimide resin composition comprising

(A) a polyaminobismalemide resin comprising a reaction product obtained by reacting a bismaleimide of general formula (I):



(I)

wherein R is a divalent organic radical, with an aromatic diamine of general formula (II):



(II)

wherein Z is -CH_2-, -O-, -S-, -SO- or -SO_2-, and

R^1 and R^2 are independently selected from the group consisting of hydrogen, lower alkyl radicals, aryl radicals, cycloalkyl radicals and lower acyl radicals;

(B) a silicone component selected from the group consisting of silicone monomers having a hydroxyl or alkoxy group bonded to a silicon atom, silicone oligomers having a hydroxy or alkoxy group bonded to a silicon atom and mixtures of said silicone monomers and silicone oligomers; and

(C) an inorganic filler;

wherein the weight ratio of polyaminobismalemide resin (A) to silicone component (B) ranges from 99.5/0.5 to 70/30, and the weight ratio of polyamonobismaleimide resin (A) to inorganic filler (C) ranges from 100/50 to 100/1000.

4,885,330

NON-DISPERSIBLE VERMICULITE PRODUCTS

Clement L. Brungardt, Wilmington, Del., and Pamela K. Rush, West Grove, Pa., assignors to Hercules Incorporated, Wilmington, Del.

Filed Nov. 20, 1987, Ser. No. 123,468
Int. Cl.[4] C08K 3/34
U.S. Cl. 524—447 5 Claims

1. An aqueous dispersion of vermiculite lamellae having incorporated therein from about 0.1% to about 4% by weight, based upon the dry weight of vermiculite in the dispersion, of a cationic polyquaternary ammonium salt.

4,885,331

POLYESTER MELT-ADHESIVE COMPOSITIONS AND METHODS OF MAKING AND USING THEM

Frank Annighofer, Heidenrod, Fed. Rep. of Germany; Ewald Schneider, Domat/Ems, and Hans-Joachim Schultze, Chur, both of Switzerland, assignors to Ems-Inventa AG, Domat-/Ems, Switzerland

Continuation-in-part of Ser. No. 3,940, Jan. 16, 1987, abandoned. This application Jun. 10, 1988, Ser. No. 206,011
Claims priority, application Switzerland, Jan. 31, 1986, 378/86
Int. Cl.[4] C08G 18/42; C08L 75/06
U.S. Cl. 524—539 14 Claims

1. An adhesive composition comprising a saturated polyester component containing at least 2 OH and/or COOH functional groups and having a viscosity of at least 12 Pa.s at 200° C. and 122.6N and a number average molecular weight greater than 10,000, and a capped isocyanate having more than one functional group.

4,885,332

PHOTOCURABLE ABRASION RESISTANT COATINGS COMPRISING SILICON DIOXIDE DISPERSIONS

Zayn Bilkadi, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 11, 1988, Ser. No. 180,056
Int. Cl.[4] C08L 33/08
U.S. Cl. 524—714 16 Claims

1. A coating composition comprising a substantially water-free dispersion of colloidal silica, a polyacryloyl monomer, and a free radical initiator.

4,885,333

POLYVINYL CHLORIDE RESIN COMPOSITION HAVING IMPROVED THERMAL STABILITY AND A METHOD FOR THE PREPARATION THEREOF

Tadashi Amano, Ibaraki, and Tokuji Abe, Saitama, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1988, Ser. No. 172,338
Claims priority, application Japan, Mar. 23, 1987, 62-68654
Int. Cl.[4] C08K 5/06; C08L 27/06
U.S. Cl. 524—762 1 Claim

1. A method for the preparation of a polyvinyl chloride resin-based composition having improved thermal stability which comprises suspension-polymerizing vinyl chloride monomer or a monomer mixture mainly composed of vinyl chloride in an aqueous polymerization medium containing a polyglycerin represented by the general formula

$$HO—CH_2—CHOH—CH_2—O—(—CH_2—CHOH—CH_2—O—)_n—CH_2—CHOH—CH_2OH,$$

in which the subscript n is a positive integer from 2 to 8, in such an amount that the polyvinyl chloride resin produced by the suspension polymerization contains the polyglycerin in an amount in the range from 0.01 to 0.5 part by weight per 100 parts by weight of the polyvinyl chloride resin.

4,885,334

THERMOPLASTIC RESIN COMPOSITION

Junji Mayumi, and Hiroshi Omori, both of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1987, Ser. No. 120,836
Claims priority, application Japan, Nov. 19, 1986, 61-275697
Int. Cl.[4] C08L 51/04, 71/04
U.S. Cl. 525—66 21 Claims

1. A thermoplastic resin composition comprising (a) a polyphenylene ether resin, (b) a polar thermoplastic resin having a polar functional group, and (c) a modified block copolymer obtained by subjecting a hydrogenated block copolymer comprising an aromatic vinyl compound polymer block (A) and a conjugated diene compound polymer block (B) to graft polymerization in the presence of a monomer having an epoxy group.

4,885,335

LOW GLOSS THERMOPLASTIC BLENDS

Robert R. Gallucci, Mt. Vernon, Ind.; Ronald J. Wroczynski, Schenectady, N.Y.; James F. Jones, Windsor, and Stefan F. Rasch, Cheshire, both of Mass., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 27, 1988, Ser. No. 289,937
Int. Cl.[4] C08L 69/00
U.S. Cl. 525—67 12 Claims

1. A low-gloss thermoplastic blend comprising:

(a) at least one thermoplastic aromatic carbonate polymer;

(b) an acrylonitrile-styrene-acrylate (ASA) interpolymer, the ratio of (a) to (b) being in the range of from about 10:90 to 90:10 by weight; and

(c) an effective gloss-reducing amount of from about 0.05 to 5% of at least one polymer of glycidyl methacrylate, in which, where said polymer of glycidyl methacrylate is a copolymer, at least one comonomer is selected from the group consisting of styrene, acrylonitrile, and esters, other than glycidol esters, of (meth)acrylic acids.

4,885,336

LOW GLOSS POLYCARBONATE BLEND

Omar M. Boutni, Mt. Vernon, Ind., and Charles F. Pratt, Bergen Op Zoom, Netherlands, assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 27, 1988, Ser. No. 289,932
Int. Cl.[4] C08L 69/00
U.S. Cl. 525—67 9 Claims

1. A low gloss thermoplastic blend which comprises: (a) an aromatic carbonate polymer; and (b) a gloss reducing amount of a polymeric additive which is a glycidyl methacrylate graft onto ethylenepropylene diene modified (EPDM) rubber further reacted with an acrylate macromonomer.

4,885,337

PROCESS FOR THE PREPARATION OF THERMOPLASTIC MOULDING COMPOSITIONS

Herbert Eichenauer, Dormagen; Alfred Pischtschan, Kuerten, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 6, 1987, Ser. No. 69,967

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1986, 3623758

Int. Cl.[4] C08L *47/00, 51/04*

U.S. Cl. 525—75 5 Claims

1. A process for the preparation of a thermoplastic moulding composition of

10 to 65% by weight of at least one graft polymer obtained by emulsion polymerization of (a) styrene, α-methylstyrene, methyl methacrylate or a mixture thereof with (b) acrylonitrile in a weight ratio of (a) to (b) of 90:10 to 50:50, in the presence of (c) at least one latex of a rubber base, where the weight ratio of (a) plus (b) to (c) is 20:80 to 70:30, and

90 to 35% by weight of a copolymer of (d) styrene, α-methylstyrene, methyl methacrylate or a mixture thereof and (e) acrylonitrile in a weight ratio of (d) to (e) of 90:10 to 50:50,

characterized in that, to prepare the graft polymer, (a), (b) and 0.05 to 1.00 part by weight over time intervals (Δt) which are each 5 to 100 minutes long wherein the amount of (a) plus (b) added time interval (Δt_{n+1}) is 0.30 to 0.95 times the amount of (a) plus (b) added in the preceding time interval (Δt_n) at least in the first half of the total time intervals, where n=3 to 30.

4,885,338

MODIFIED DIENE POLYMER RUBBERS

Hiroyoshi Takao, Chiba; Akio Imai, and Tomoaki Seki, both of Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

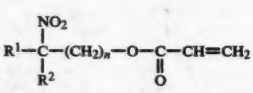
Filed May 4, 1988, Ser. No. 188,326

Claims priority, application Japan, May 11, 1987, 62-115521; May 11, 1987, 62-115522

Int. Cl.[4] C08C *19/22, 19/28;* C08F *279/02*

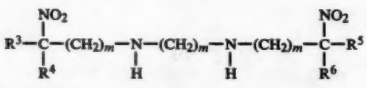
U.S. Cl. 525—77 13 Claims

1. A process for preparing a modified diene polymer which comprises reacting an alkali metal-containing conjugated diene polymer with a modifier selected from the group consisting of a nitroalkyl acrylate of the formula (1):



(1)

wherein R^1 and R^2 are an alkyl group, and n is an integer, and a nitroamino compound of the formula (2):



(2)

wherein R^3, R^4, R^5 and R^6 are an alkyl group, and m is an integer, said alkali metal-containing conjugated diene polymer being a living polymer having an alkali metal end prepared by a polymerization of a conjugated diene monomer or a mixture of a conjugated diene monomer and an aromatic vinyl monomer in a hydrocarbon solvent in the presence of an alkali metal-based catalyst, or a polymer to which an alkali metal is introduced by an addition reaction of a diene polymer having conjugated diene units in the polymer chain and an alkali metal-based catalyst in a hydrocarbon solvent.

4,885,339

POLYPHENYLENE ETHER/POLYSTYRENE BLENDS

Thomas D. Traugott; Eugene R. Moore, and Michael T. Malanga, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 124,540, Nov. 23, 1987, Pat. No. 4,804,712. This application Sep. 2, 1988, Ser. No. 240,844

Int. Cl.[4] C08L *71/04*

U.S. Cl. 525—132 8 Claims

1. A molding composition comprising:

from 5 to 95% by weight of at least one arylene ether polymeric material;

from 95 to 5% by weight of at least one anionically polymerized vinylidene aromatic compound, said polymerized vinylidene aromatic compound having a weight average molecular weight of at least 50,000; and

a molecular weight distribution not greater than 1.8.

4,885,340

HIGH IMPACT POLYAMIDE COMPOSITION

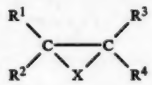
Tetsuo Hamada; Junichi Nakahashi, both of Nobeoka, and Ryoichi Nakai, Kurashiki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 28, 1988, Ser. No. 174,279

Int. Cl.[4] C08L *77/00*

U.S. Cl. 525—183 3 Claims

1. A high impact polyamide composition comprising at least one polyamide (A), at least one ethylene ionomer resin (B) and at least one carbonate compound (C) of the formula (I)



(I)

wherein R^1, R^2, R^3 and R^4 each independently represent a hydrogen atom or a lower alkyl group, and X represents a divalent group of the formula (III)

(III)

the weight proportion of the polyamide (A) relative to the total of the components (A) and (B) being 60 to 95%, the weight proportion of the ethylene ionomer resin (B) relative to the total of the components (A) and (B) being 40 to 5%, and the weight proportion of the carbonate compound (C) relative to the total of the components (A) and (B) being 0.05 to 5.0%;

the polyamide (A) having a relative viscosity of at least 3.15 as measured at 25° C. with respect to a solution prepared by dissolving 1 g of the polyamide in 100 ml of 98% sulfuric acid.

4,885,341

RUBBER COMPOSITION

Mitsuyoshi Aonuma, Tokyo, and Nagatoshi Sugi, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 212,788

Claims priority, application Japan, Jun. 29, 1987, 62-161466

Int. Cl.[4] C08L *15/02, 23/34, 9/00, 23/28*

U.S. Cl. 525—187 4 Claims

1. A rubber composition comprising 20 to 70% by weight of a first rubber component which is butyl rubber, a halogenated butyl rubber or a mixture of both as a first vulcanized rubber component and 80 to 30% by weight of a second unvulcanized

rubber component which is at least one rubber selected from chlorinated polyethylene rubber, chlorosulfonated polyethylene rubber and epichlorohydron rubber, the first rubber component being dispersed as crosslinked rubber particles in the second rubber component by dynamic vulcanization or by blending the second rubber component with a powder of the crosslinked first rubber component.

4,885,342

THERMOPLASTIC POLYMER MIXTURE WITH A HIGH SURFACE GLOSS

Reinier G. Bakker, Heerlen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Sep. 21, 1988, Ser. No. 247,393

Claims priority, application Netherlands, Oct. 13, 1987, 8702438

Int. Cl.[4] C08L *35/02, 23/28, 23/16, 23/22*

U.S. Cl. 525—230 17 Claims

1. Thermoplastic polymer mixture with a high surface gloss on the basis of a copolymer of a vinyl aromatic compound and an unsaturated nitrile, a largely saturated rubber and a chlorinated polyethylene, characterized in that the polymer mixture comprises:

a 50–95 wt.% of

a.1 20–90 wt.% of a copolymer of styrene and/or α-methyl-styrene with acrylonitrile with an acrylonitrile content of 18–27 wt.%, the copolymer having a fluidity of 3–20;

a.2 5–60 wt.% of a copolymer of styrene and α-methyl-styrene with acrylonitrile with an acrylonitrile content of 25–40 wt.%, the copolymer having a fluidity of at least 25;

a.3 0–30 wt.% of a polyacrylate compound;

b 5–50 wt.% of

b.1 a substantially saturated rubber and

b.2 a chlorinated polyethylene.

4,885,343

PREPARATION OF TRIBLOCK COPOLYMERS

Kent S. Dennis, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 33,444, Apr. 1, 1987, Pat. No. 4,839,430. This application Mar. 3, 1989, Ser. No. 318,788

Int. Cl.[4] C08L *297/02*

U.S. Cl. 525—280 20 Claims

1. A method for the preparation of block copolymer of the ABA configuration, the steps of the method comprising:

(a) providing a first anionically polymerizable monomer portion used in polymerizing the A block polymer chains, which first monomer portion has at least one vinyl pyridine monomer or combinations thereof with at least one monomer selected from the group consisting of styrene, α-methylstyrene, m-ethylstyrene, p-methoxy-α-methylstyrene, p-ethyl-α-methylstyrene, p-ethyl-α-ethylstyrene, 2,4-diethylstyrene, m-isopropylstyrene, butadiene, dimethylbutadiene, isoprene, piperylene, mono- or diortho-, halo-substituted styrenes,;

(b) anionically polymerizing the first monomer portion to provide A block polymer chains having living ends;

(c) contacting the A block polymer chains with a second anionically polymerizable monomer portion used in polymerizing the B block polymer chain, which second monomer portion has at least one monomer selected from the group consisting of styrene, m-ethylstyrene, 2,4-diethylstyrene, m-isopropylstyrene, butadiene, dimethylbutadiene, isoprene, piperylene, mono- or diortho-, halo-substituted styrenes, or combinations thereof, provided that at least one monomer selected from the second monomer portion is different from at least one monomer selected from the first monomer portion;

(d) anionically polymerizing the second monomer portion in the presence of the A block polymer chains to form A-B block polymer chains having living ends;

(e) contacting said A-B block polymer chains with up to at least a quantity sufficient to react with a substantial proportion of said polymer chain living ends of an α-alkylstyrene or a ring-alkyl substituted α-alkylstyrene, wherein the α-alkyl groups contain between about 1 to about 20 carbon atoms, and the ring-alkyl groups have at least 2 carbon atoms; and

(f) coupling the A-B block polymer chains with a difunctional coupling agent to bring about substantial coupling.

4,885,344

POLYMERIC MATERIALS AND THEIR USE AS RESISTS

Stanley Affrossman, Bearsden; Massoud Bakhshaee, Glasgow; Richard A. Pethrick, Newlands, and David C. Sherrington, Lenzie, all of Scotland, assignors to National Research Development Corporation, London, England

Filed Jan. 19, 1988, Ser. No. 145,238

Claims priority, application United Kingdom, Jan. 19, 1987, 8701021

Int. Cl.[4] C08F *265/04, 267/06*

U.S. Cl. 525—302 19 Claims

1. A film-forming polymeric material, suitable for use as a positive resist, which comprises (a) a backbone, degradable by irradiation, comprising the residue of a homo- or co-polymer formed by the addition polymerisation of at least one olefinically unsaturated compound in which at least one of the olefinically unsaturated carbon atoms is not bonded to a hydrogen atom and/or at least one compound comprising a 3- or 4-membered carbocyclic or a ring sulphur atom-containing heterocyclic compound in which at least one of the ring carbon atoms is not bonded to a hydrogen atom and (b), depending from (a) and differing therefrom, at least 3 homo- or co-polymeric pendant groups which may be the same or different and which, in service, show no appreciable positive or negative resist characteristics at the radiation dosage used.

4,885,345

ALKOXYLATED/CATIONICALLY MODIFIED AMIDE-CONTAINING POLYMERS

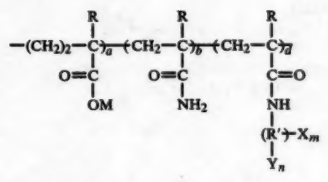
Dodd W. Fong, Naperville, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 831,963, Feb. 24, 1986, Pat. No. 4,731,419. This application Nov. 23, 1987, Ser. No. 123,759

Int. Cl.[4] C08F *8/32*

U.S. Cl. 525—329.4 3 Claims

1. The polymer:



wherein;

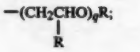
R is chosen, at each occurrence, from hydrogen and methyl groups;

R' is a linear or branched alkylene, multi-covalent, bridging group, having from 1 to 6 carbon atoms;

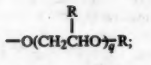
M is chosen, at each occurrence, from H, Li, Na, K, NH_4, and mixtures thereof;

X is represented by:

where p is 0 or 1, and
where R'' is chosen from, at each occurrence, a lower alkyl (C_1 - C_4) group and an alkoxyl group represented by



and wherein
Y is



and q is from 1 - 30; and
m is from 1 - 6, and
n is 1 to 6, and the sum, m+n, is from 2 to 12; and
wherein the sum, a+b+d, is sufficient to achieve a molecular weight of at least 1,000; and the fractions, a/b, and a/d both range individually from 0.1 to 100; and, the fraction, b/d, is from 0.01 to 100; and, (a+b)/d is from 0.15 to 100; and the mer units accounted for by a, b, and d are randomly distributed within the polymer.

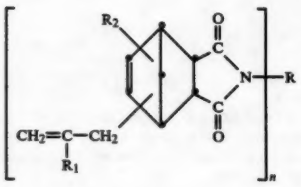
4,885,346

MIXTURE CONTAINING DICYANATE OR POLYCYANATE COMPOUND, SUBSTITUTED BICYCLO[2.2.1]HEPT-5-ENE-2,3-DICARBOXIMIDE AND THERMOPLASTIC

Andreas Kramer, Düdingen, and Francis Perritaz, Bulle, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,883
Claims priority, application Switzerland, Dec. 17, 1987, 4925/87
Int. Cl.[4] C08L 79/08, 81/02, 81/06
U.S. Cl. 525—426 **11 Claims**

1. A heat curable mixture comprising
(a) 5 to 95% by weight of at least one aromatic dicyanate or polycyanate compound or a prepolymer thereof,
(b) 95 to 5% by weight of at least one compound of formula I or II



(I)

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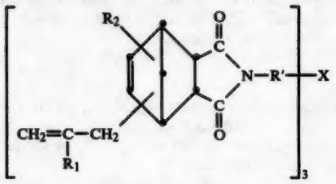
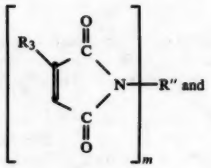


(II)

or of a prepolymer of a compound of formula I or II,
(c) 0 to 50% by weight, based on the sum of (a)+(b), of at least one compound of formula III



(III)

(d) 0.1 to 50% by weight, based on the sum of (a)+(b), of at least one thermoplastic having a glass transition temperature of at least 120° C., in which formulae above
R_1, R_2 and R_3 are each independently of one another a hydrogen atom or methyl,
n is 1 or 2 and m is 2 or 3,
R, when n is 1, is a hydrogen atom, C_1–C_{12}alkyl, C_3–C_6alkenyl, C_5–C_8cycloalkyl, C_6–C_{10}aryl or benzyl, or, when n is 2, is $-C_pH_{2p}$, in which p is 2 to 20, C_6–C_{10}arylene or a group of formula IV

(IV)

wherein T is methylene, isopropylidene, CO, O, S or SO_2,
X is

R' is $-C_qH_{2q}-$, in which q is 2 to 20, $-C_rH_{2r}-O-$, in which r is 2 t 6, m- or p-phenylene, m- or p-phenyleneoxy, the oxygen atom being attached to the group X and
R'' is an organic radical of valency m containing 2 to 30 carbon atoms.

4,885,347

POLYMER CONTAINING HINDERED AMINE LIGHT STABILIZING GROUPS AND PROCESS OF MAKING THE SAME

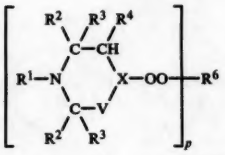
Terry N. Myers, Erie, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 87,473, Aug. 20, 1987, Pat. No. 4,872,823, which is a continuation-in-part of Ser. No. 831,393, Feb. 19, 1986, abandoned. This application Jan. 11, 1989, Ser. No. 295,870

Int. Cl.[4] C08G *63/20*

U.S. Cl. 525—447 **10 Claims**

1. A process of preparing a cured polyester containing hindered amine light stabilizer groups chemically connected to the polyester comprising curing an unsaturated polyester resin capable of being cured by free radicals in the presence of a curing amount of a compound having the formula



wherein

p is 1 or 2, and

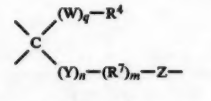
R^1 is selected from hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–12 carbons, substituted or unsubstituted araliphatic of 7–22 carbons, substituted or unsubstituted aliphatic acyl of 2–21 carbons, substituted or unsubstituted alicyclic acyl of 6–13 carbons, substituted or unsubstituted aryl acyl of 7–11 carbons, substituted or unsubstituted araliphatic acyl of 7–22 carbons, —C(=O)—N(R^4)(R^5), —C(=O)—O—R^9, and —(CH_2—CH(R^4)—O)$_r$—R^4 where r is 2–50, and

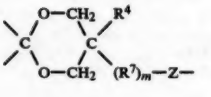
R^2 and R^3 may be the same or different and are independently selected from substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted aryl of 6–10 carbons, and substituted or unsubstituted araliphatic of 7–22 carbons, and R^2 and R^3 can be taken together with the carbon to which they are attached to form a substituted or unsubstituted saturated alicyclic group of 4–12 carbons, and

V is selected from —CH(R^5)— and —C(=O)—, and

R^4 and R^5 may be the same or different and are independently selected from hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted aryl of 6–10 carbons, and substituted or unsubstituted araliphatic of 7–22 carbons, substituted or unsubstituted alicyclic of 5–12 carbons which may optionally contain 1–3 heteroatoms selected from oxygen, sulfur, and nitrogen atoms in the ring, the nitrogen atom having a hydrogen atom or a methyl group bonded thereto, with the proviso that multiple heteroatoms must be separated from each other and from the portion of the compound to which the alicyclic group is bonded by at least one carbon atom, and

when V is —CH(R^5)—, X is selected from





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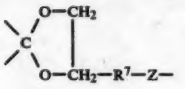
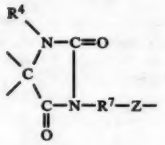
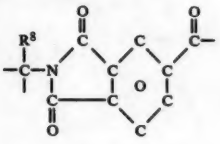
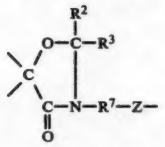
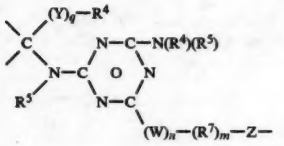








and



and when V is —C(=O)—, X is , and

R^7 is selected from a substituted or unsubstituted aliphatic diradical of 1–20 carbons, substituted or unsubstituted aryl diradical of 6–10 carbons, substituted or unsubstituted alicyclic diradical of 5–12 carbons, and substituted or unsubstituted araliphatic diradical of 7–22 carbons, and the diradical chain(s) may optionally contain 1–6 heteroatoms selected from oxygen, sulfur, and nitrogen atoms, the nitrogen atom having a hydrogen atom or a methyl group bonded thereto, with the proviso that multiple heteroatoms must be separated from each other and from the portion of the compound to which the diradical is bonded by at least one carbon atom,

R^8 is selected from hydrogen, substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted alicyclic of 5–12 carbons, substituted or unsubstituted aryl of 6–10 carbons, substituted or unsubstituted araliphatic of 7–22 carbons, —C(=O)—O—R^9, and —(CH_2—CH(R^4)—O)$_r$—R^5, and

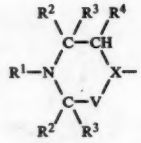
W is selected from —O—, —S—, and —N(R^5)—, and

Y is selected from —Z—, —O—, —S—, —N(R^4)—, —S(=O)—, —O—S(=O)—, —O—S(=O)$_2$—, —NH—C(=O)—NH—, —O—C(=O)—O—, —C(=O)—O—, —O—C(=O)—C(=O)—O—, —O—C(=O)—C(=O)—N(R^4)—, —N(R^4)—C(=O)—C(=O)—O—, and —N(R^4)—C(=O)—C(=O)—N(R^4)—,

n, m and q are integers independently selected from 0 and 1 with the proviso that when m is 0, n must be 0,

Z is selected from —C(=O)—, —S(=O)$_2$—, —C(R^9)(R^{10})—, —O—C(=O)—, —N(R^4)—C(=O)—, —O—C(=O)—C(=O)—, —N(R^4)—C(=O)—C(=O)—, —Si(R^4)(R^5)—, —Si(O—R^4)(O—R^5)—, and —P(O)(O—R^4)(O—R^5)—, and

when p is 1, R^6 is selected from hydrogen, substituted or unsubstituted tertiary aliphatic of 4–24 carbons, substituted or unsubstituted tertiary alicyclic of 6–13 carbons, substituted or unsubstituted tertiary araliphatic of 9–24 carbons, substituted or unsubstituted aliphatic acyl of 2–21 carbons, substituted or unsubstituted aryl acyl of 7–11 carbons, substituted or unsubstituted araliphatic acyl of 8–22 carbons, —C(=O)—N(R^4)(R^5), —C(=O)—O—R^9, —C(R^9)(R^{10})—C(=O)—O—R^4, —S(=O)$_2$—R^4, and



when p is 2, R^6 is selected from substituted or unsubstituted di-tertiary aliphatic of 6–27 carbons, substituted or unsubstituted di-tertiary alicyclic diradical of 7–14 carbons, substituted or unsubstituted di-tertiary araliphatic of 12–27 carbons, substituted or unsubstituted aliphatic diacyl of 3–21 carbons, substituted or unsubstituted alicyclic diacyl of 7–15 carbons, substituted or unsubstituted aryl diacyl of 8–12 carbons, or substituted or unsubstituted araliphatic diacyl of 9–24 carbons,

R^9 and R^{10} are independently selected from substituted or unsubstituted aliphatic of 1–20 carbons, substituted or unsubstituted aryl of 6–10 carbons, substituted or unsubstituted araliphatic of 7–22 carbons, and substituted or unsubstituted alicyclic of 5–12 carbons which may optionally contain 1–3 heteroatoms selected from oxygen, sulfur, and nitrogen atoms in the ring, the nitrogen atom having a hydrogen atom or a methyl group bonded thereto, with the proviso that multiple heteroatoms must be separated from each other and from the portion of the compound to which the alicyclic group is bonded by at least one carbon atoms, and when both are present, R^9 and R^{10} can be connected to each other by an alkylene diradical bridge containing 4–9 carbons, which may optionally contain 1–3 heteroatoms selected from oxygen, sulfur, and nitrogen atoms in the ring, the nitrogen atom having a hydrogen atom or a methyl group bonded thereto, with the provisos that multiple heteroatoms must be separated from each other and from the portions of the compound to which the diradical bridge is bonded by at least one carbon atom, and when R^6 is tertiary aliphatic, tertiary alicyclic or tertiary araliphatic, R^{10} may also be selected from —OO—R^6 and —O—R^9, and

optional substituents for R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9 and R^{10} are one or more groups selected from halogen, alkyl of 1–8 carbons, alkoxy of 1–8 carbons, —C≡N, —OH, epoxy, carboxy, alkoxycarbonyl of 2–6 carbons, acyloxy of 1–4 carbons, acryloyl, acryloyloxy, methacryloyl, methacryloyloxy, hydroxymethyl, hydroxyethyl, alkylmercapto of 1–4 carbons and trialkoxysilyl of 3–12 carbons.

4,885,348

UREA-MODIFIED ISOCYANATES

James P. Brown, Sterrebeek; Ernst O. Düber, Tervuren, and Mark Loenders, Kessel-Lo, all of Belgium, assignors to Imperial Chemical Industries PLC, Welwyn Garden City, United Kingdom

Continuation of Ser. No. 103,565, Oct. 1, 1987, abandoned. This application Aug. 19, 1988, Ser. No. 236,282

Claims priority, application United Kingdom, Oct. 6, 1986, 8623971

Int. Cl.^{4} C08L *75/00*

U.S. Cl. 525—458 **8 Claims**

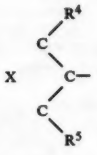
1. A dispersion in an aromatic polyisocyanate of a reaction product of the polyisocyanate with amine characterized in that at least part of said amine has the formula:

wherein Q represents hydrogen or a hydrocarbyl radical containing from 1 to 20 carbon atoms and R represents a hydrocarbyl radical containing from 1 to 20 carbon atoms selected from:

(1) radicals of the formula:

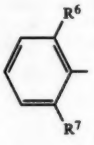
wherein R^1 represents hydrogen or a hydrocarbyl radical and each of R^2 and R^3, which may be the same or different, represents a hydrocarbyl radical, R^1, R^2 and R^3 together containing at least three carbon atoms;

(2) cycloalkyl radicals of the formula:



wherein X represents a chain of 2–4 carbon atoms, R^4 represents hydrogen or a hydrocarbyl radical and R^5 represents a hydrocarbyl radical; and

(3) aryl radicals of the formula:



wherein R^6 represents a hydrocarbyl radical and R^7 represents a hydrocarbyl radical containing at least two carbon atoms,

or wherein R and Q together with the attached nitrogen atom form a piperidine, morpholine or pyrolidine ring bearing a hydrocarbyl radical containing from 1 to 20 carbon atoms on at least one of the carbon atoms adjacent to the nitrogen atom.

4,885,349

PROCESS FOR POLYMERIZING ALPHA-OLEFIN POLYMERS OF RELATIVELY NARROW MOLECULAR WEIGHT DISTRIBUTION AND HIGH MELT INDEX

Thomas E. Nowlin, Somerset, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 15,581, Feb. 17, 1987, Pat. No. 4,738,942, which is a continuation of Ser. No. 812,021, Dec. 23, 1985, abandoned. This application Feb. 18, 1988, Ser. No. 157,821
Int. Cl.[4] C08F 4/64, 10/00
U.S. Cl. 526—122 57 Claims

1. A process for polymerizing at least one C_2–C_{10} alpha-olefin to produce a LLDPE having a density of about 0.900 g/cc to about 0.940 g/cc and an MFR of about 20 to about 32 or a HDPE having a density of about 0.940 g/cc to about 0.965 g/cc and an MFR of about 20 to about 32 comprising conducting the polymerization in the presence of a supported catalyst composition prepared by a process comprising the steps of:

(i) contacting a solid, porous carrier with a solution of a mixture of at least one organomagnesium composition having the empirical formula

$$(OR')_nMg(OR)_m \quad (I)$$

where R and R' are the same or different C_1–C_{12} hydrocarbyl groups, m and n are each 0, 1 or 2, provided that the sum of m+n is equal to the valence of Mg, and at least one compound of the formula

$$MX_p \quad (II)$$

where M is Si, C, Ge or Sn, X is Cl or Br, and p is the valence of M, in a solvent selected from the group consisting of aliphatic ethers, cyclic ethers and aliphatic ketones, the compound of formula (II) rendering the composition of formula (I) soluble in the solvent;

(ii) removing said solvent from step (i) to obtain a magnesium-containing carrier in the form of a substantially dry, free-flowing powder;

(iii) slurrying said powder of step (ii) in a liquid medium and contacting the resulting slurry with at least one transition metal compound, said transition metal compound being soluble in said liquid medium, and said magnesium-containing carrier being substantially insoluble in said liquid medium; and

(iv) activating a catalyst precursor produced in said step (iii) with a catalyst activator to form the supported catalyst composition.

4,885,350

METHOD OF PRODUCING POLYMER PARTICLES HAVING NARROW PARTICLE SIZE DISTRIBUTION

Hiroshi Yamashita, Shizuoka, and Kenkichi Muto, Kanagawa, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 752,591, Jul. 8, 1985, abandoned. This application Aug. 24, 1987, Ser. No. 89,036
Claims priority, application Japan, Jul. 6, 1984, 59-139115
Int. Cl.[4] C08F 2/14
U.S. Cl. 526—201 1 Claim

1. A method of producing polymer particles having a particle size distribution of ±25% with respect to each average particle size in an amount of 95 wt. % or more, within the average particle sizes ranging from 1 μm to 100 μm, comprising the steps of:

(1) adding polymeric dispersion stabilizer in an amount of 0.1 to 10 wt. % to a hydrophilic organic liquid in which said polymeric dispersion stabilizer is soluble;

(2) adding thereto at least one vinyl monomer in an amount of said polymeric dispersion stabilizer so that a minimum amount of at least 5 wt. % of said polymeric dispersion stabilizer relative to the amount of vinyl monomer is present, which monomer is soluble in said hydrophilic organic liquid, but when polymerized, said polymer is swellable or is substantially insoluble in said hydrophilic organic liquid wherein said polymeric dispersion stabilizer is selected from the group consisting of homopolymers and copolymers of vinylpyridine, vinylpyrrolidone, N-vinylimidazole and ethyleneimine; and

(3) polymerizing said monomer under the condition that the amount of said vinyl monomer is 200 wt. % or less of said hydrophilic organic liquid, wherein said hydrophilic organic liquid is selected from the group consisting of methyl alcohol, ethyl alcohol, modified ethyl alcohol, isopropyl alcohol, n-butyl alcohol, isobutyl alcohol, tert-butyl alcohol, sec-butyl alcohol, tert-amyl alcohol, 3-pentanol, octyl alcohol benzyl alcohol, cyclohexanol, furfuryl alcohol, tetrahydrofurfuryl alcohol, ethylene glycol, glycerol and diethylene glycol.

4,885,351

SPIRODILACTAM DERIVATIVES

Pen C. Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 23, 1989, Ser. No. 314,512
Int. Cl.[4] C08F 22/40
U.S. Cl. 526—262 11 Claims

1. The cured product obtained by heating a substituted 1,6-diaza[4.4]spirodilactam having an unsaturated substituent on each spiro ring nitrogen atom, which unsaturation is terminal, hydrocarbyl and is separated from the nitrogen atom to which the substituent is attached by one carbon atom or by an aromatic ring to a temperature over about 150° C. in the presence of a curing agent.

4,885,352

TRANSPARENT PLASTIC FILM COMPRISING LOW DENSITY POLYETHYLENE

Laurence R. Erickson, Midland, Mich., assignor to DowBrands Inc., Indianapolis, Ind.

Division of Ser. No. 24,427, Mar. 11, 1987, abandoned. This application Feb. 29, 1988, Ser. No. 161,588
Int. Cl.[4] B32B 27/32; C08F 110/02
U.S. Cl. 526—348.1 4 Claims

1. A transparent plastic film having balanced physical properties comprising (1) a homopolymer of ethylene having a density of between about 0.92 to about 0.94 and a melt index of between about 1 decigrams per minute to about 6 decigrams per minute, said film having a two percent secant modulus of greater than 172 MPa and less than 210 MPa; and a Puncture, Propagation, and Tear resistance of greater than 140 mN/μm and less than 200 mN/μm;

wherein the film has an amorphous phase and a crystalline phase with polyethylene crystalline units, said polyethylene crystalline units having an a-axis orientation, as measured by IR trichroism, of A_X/A_O between about 1.0 to 1.5; A_Y/A_O between about 0.7 to 1.0; and A_Z/A_O between about 0.7 to 1.0.

4,885,353

LIQUID ISOCYANATE PREPOLYMERS

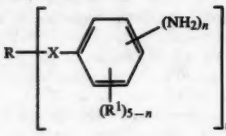
William E. Slack, Moundsville, W. Va., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Nov. 16, 1988, Ser. No. 272,184
Int. Cl.[4] C08G 18/10
U.S. Cl. 528—68 3 Claims

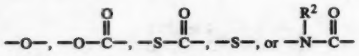
1. A liquid, storage-stable isocyanate prepolymer having an isocyanate group content of from 3 to 30% by weight, prepared by reacting

(i) an isocyanate selected from the group consisting of methylene bis(phenylisocyanates), polymethylene poly(phenylisocyanates), and mixtures thereof, and

(ii) a polyamine of the structure



where R represents an m-valent residue obtained by the removal of m-functional groups from a compound having m-functional groups and having a molecular weight of from 76 to about 10,000,



R^1 represents hydrogen or an inert substituent,

R^2 represents hydrogen, a C_1 to C_5 alkyl group or a phenyl group,

n is 1 or 2, and

m is an integer of from 2 to 8.

4,885,354

EPOXY RESIN COMPOSITIONS

Arnold Hofer, Muttenz, and Hans Gempeler, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 17, 1988, Ser. No. 258,542

Claims priority, application Switzerland, Oct. 29, 1987, 4229/87; Jun. 29, 1988, 2472/88

Int. Cl.[4] C08G *59/68*

U.S. Cl. 528—94 **10 Claims**

1. An epoxy resin composition comprising an epoxy resin that is liquid at room temperature and containing on average more than one epoxy group per molecule and a catalytically effective amount of a quaternary piperidinium salt as advancement catalyst.

8. A method of advancing epoxy resins which comprises incorporating a catalytically effective amount of a quaternary piperidinium salt as advancement catalyst into a composition comprising an epoxy resin and a polyhydric phenol.

4,885,355

WATER-INSOLUBLE POLYMERS FROM CYCLIC SULFONIUM COMPOUNDS

Ritchie A. Wessling; Donald L. Schmidt, both of Midland, Mich., and Kiyoshi I. Aikawa, Chiba, Japan, assignors to The Dow Chemical Company, Midland, Mich.

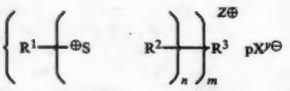
Division of Ser. No. 448,083, Dec. 9, 1982, abandoned. This application Aug. 26, 1988, Ser. No. 236,819

Int. Cl.[4] C08G *59/00, 65/00;* C08F *28/06*

U.S. Cl. 528—99 **8 Claims**

1. A water-insoluble cured product resulting from heating a water-soluble cyclic aliphatic sulfonium salt represented by the formula

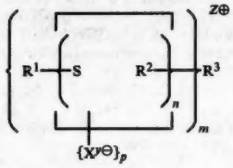
Formula I



or

-continued

Formula II



wherein R^1 is an n-valent organic radical wherein each valence bond to the sulfonium moiety is on an aliphatic carbon other than benzyl; R^2 is a polyvalent organic radical that unites with the sulfonium atom to form a 5- to 7-membered ring; said R^2 bearing a molecular weight enhancing substitutent (R^3); X is a suitable counteranion which may be covalently bonded to R^1, R^2 or R^3 as depicted in Formula II; n is an integer from 1 to 500, m is an integer from 1 to 500 provided that the product of $m \times n \leqq 500$, y is a number from 1 to 4, z is a number corresponding to the net cationic charge on the sulfonium cation and p is a number equal to z/y, until the sulfonium moiety is converted to a sulfide moiety.

4,885,356

HIGH MOLECULAR WEIGHT POLY(TOLUENEDIAMINE ARAMIDE) AND A METHOD FOR THEIR PREPARATION

Barton Milligan, Freeport, The Bahamas, and Roland Libers, Dickinson, Tex., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

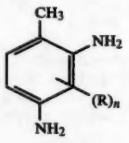
Filed Jun. 28, 1988, Ser. No. 212,449

Int. Cl.[4] C08G *69/32*

U.S. Cl. 528—340 **20 Claims**

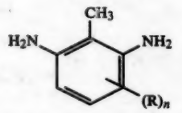
1. In a process for the production of aromatic polyamides by the reaction of at least one aromatic diamine with aromatic diacid halide, in the presence of an inert solvent under conditions for forming a low molecular weight precondensate and then subsequently polymerizing the precondensate in the presence of an acid acceptor, the improvement wherein the at least one aromatic diamine comprises a mixture of aromatic diamines represented by the formulas:

Formula I



and

Formula II



wherein R is hydrogen or C_{1-6} alkyl radical and n is 1 or 2; and wherein the weight percent of the aromatic diamine represented by formula I and that of formula II in the mixture is from 65 to 80% by weight and 20–35% respectively.

4,885,357

MODIFIED ZEIN PROTEINS CONTAINING LYSINE

Brian Larkins, West Lafayette, Ind.; Richard E. Cuellar, Glen Ellyn, Ill., and Wallace John C., West Lafayette, Ind., assignors to Lubrizol Genetics Inc., Wickliffe, Ohio and Purdue Research Foundation Inc., West Lafayette, Ind.

Division of Ser. No. 929,751, Nov. 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 744,913, Jun. 12, 1985, abandoned. This application Apr. 21, 1988, Ser. No. 184,348

Int. Cl.[4] G01N *33/48;* A61K *35/78, 35/80*

U.S. Cl. 530—373 **9 Claims**

1. A modified 19 kd or 22 kd zein, the amino acid composi-

tion of which comprises a lysine wherein said lysine is located within an internal repeated region of said zein.

4,885,358

MONOCLONAL ANTIBODIES SPECIFIC FOR SYNTHETIC GLYCOSPHINGOLIPIDS HAVING ABNORMAL BRANCHED STRUCTURE

Reiji Kannagi, Kyoto; Katsuyoshi Shigeta, Suita; Yukishige Ito, Tokyo; Yoshiko Kirihata, Kyoto, and Tomoya Ogawa, Musashino, all of Japan, assignors to MECT Corporation, Tokyo, Japan

Filed Feb. 11, 1987, Ser. No. 13,536

Int. Cl.[4] A61K *39/395;* **C07K** *15/14*

U.S. Cl. 530—387 **10 Claims**

1. A murine monoclonal antibody that specifically binds to an abnormal branched structure of a glycolipid antigen, wherein said antigen is a chemically synthesized lactoganglioseries glycolipid having the structure: t,0280

wherein said monoclonal antibody has 0% to 0.78% cross-reactivity with asialo GM_2 and amino CTH, and wherein said abnormal branched structure is a branched 1→3 connection.

4,885,359

METHOD FOR THE PURIFICATION OF LPF-HA

Akihiro Ginnaga; Tsukasa Nishihara; Tetsuo Kawahara; Sadao Susumi; Hiroshi Mizokami, and Mitsuo Sakoh, all of Kumamoto, Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan

Continuation of Ser. No. 753,867, Jul. 11, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 122,576

Claims priority, application Japan, Jul. 19, 1984, 59-150945; Aug. 22, 1984, 59-175710; Sep. 10, 1984, 59-190244

Int. Cl.[4] C07K *15/04, 17/12;* **A61K** *37/02, 39/10*

U.S. Cl. 530—396 **7 Claims**

1. A method for the purification of LPF-HA (Leucocytosis promoting factor hemagglutinin) produced by *Bordetella pertussis,* which comprises centrifuging a culture of *B. pertussis,* regulating the supernatant to a specific conductivity of 5.0 to 25.0 mS/cm and a pH of 5 to 9, passing the regulated supernatant through a column packed with a gel selected from the group consisting of a cellulose sulfate gel and a crosslinked polysaccharide sulfate gel which has been previously equilibrated by treatment with a buffer having a pH of 5.0 to 9.0 and a specific conductivity of 0.5 to 5.0 mS/cm, subjecting the resulting LPF-HA-containing solution to absorption of the LPF-HA with said gel under the conditions of pH of 5.0 to 9.0, a temperature of 0° to 30° C. and a specific conductivity of 0.5 to 5.0 mS/cm, and eluting the absorbed LPF-HA from the gel with a buffer having a specific conductivity of 5.0 to 100.0 mS/cm, said cellulose gel and said crosslinked polysaccharide sulfate gel being prepared by sulfating cellulose and a crosslinked polysaccharide, respectively, with a sulfating agent in an organic solvent.

4,885,360

REACTIVE DYES CONTAINING A SULFONYL AND AN ALIPHATIC ACYL REACTIVE RADICAL

Peter Scheibli, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

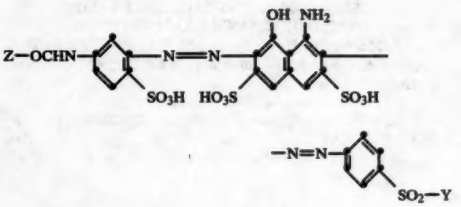
Continuation of Ser. No. 14,086, Feb. 3, 1987, abandoned, which is a continuation of Ser. No. 748,716, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 561,484, Dec. 14, 1983, abandoned. This application Nov. 21, 1988, Ser. No. 275,651

Claims priority, application Switzerland, Dec. 20, 1982, 7431/82

Int. Cl.[4] C09B *62/83, 62/84, 62/835, 62/825*

U.S. Cl. 534—642 **2 Claims**

1. A reactive dye of the formula



wherein Z is α,β-dibromoethyl, α-bromovinyl, 3-(β-chloroethylsulfonyl)-propyl or 3-vinylsulfonylpropyl, and Y is β-sulfatoethyl, vinyl, β-acetoxyethyl, β-phosophonooxyethyl, β-thiosulfatoethyl or β-chloroethyl.

4,885,361

SULFATED OLIGOSACCHARIDES

Hans P. Wessel, Heitersheim, Fed. Rep. of Germany, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

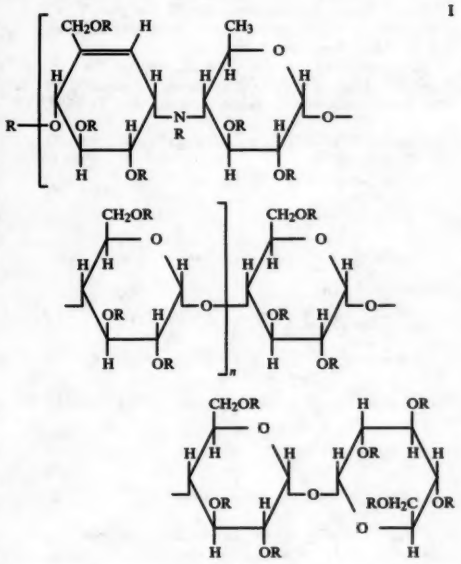
Filed Jul. 20, 1988, Ser. No. 221,578

Claims priority, application Switzerland, Jul. 31, 1987, 2938/87

Int. Cl.[4] C07H *11/00, 5/06*

U.S. Cl. 536—118 **4 Claims**

1. Compounds containing a plurality of monosaccharides of the formula



I

wherein n is a whole number of from 1 to 3; R is hydrogen or a residue —SO_3M and M is a cation; said compounds containing a degree of sulfation per monosaccharide of at least 1.

4,885,362

AZETIDINONE INTERMEDIATES FOR 1-CARBA(DETHIA)CAPHALOSPORINS

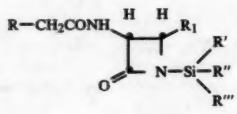
John M. Morin, Jr., Brownsburg, and William C. Vladuchick, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 6, 1988, Ser. No. 202,287

Int. Cl.[4] C07D *705/08, 403/06, 409/12;* **C07F** *7/10*

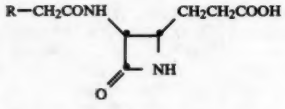
U.S. Cl. 540—364 **6 Claims**

1. A compound of the formula



wherein R is phenyl, phenoxy or thienyl; R_1 is $—CH_2CH_2$[or $—CH_2CH_2C(O)—CH_2COOR_1'$, wherein R_1' is hydrogen, benzyl, p-methoxybenzyl, p-nitrobenzyl or diphenylmethyl], R_2 is hydroxy, imidazol-1-yl or a carobxy-protecting group; and R', R'' and R''' independently are C_1–C_4 alkyl, aryl, or aralkyl.

6. The compound of the formula



wherein R is phenyl or phenoxy.

4,885,363

1-SUBSTITUTED-1,4,7-TRISCARBOXYMETHYL-1,4,7,10-TETRAAZACYCLODODECANE AND ANALOGS

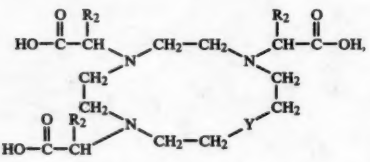
Michael F. Tweedle, Hightstown; Glen T. Gaughan, West Trenton, and James T. Hagan, Holmdel, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 42,416, Apr. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 821,725, Jan. 23, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,267

Int. Cl.[4] C07D *255/02, 273/00;* **C07F** *5/00, 13/00*

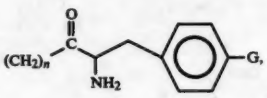
U.S. Cl. 540—465 **144 Claims**

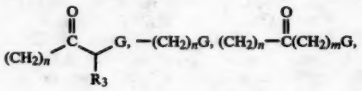
1. A compound having the formula

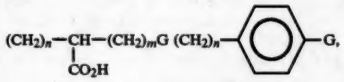


or a pharmaceutically acceptable salt thereof, wherein Y is oxygen or

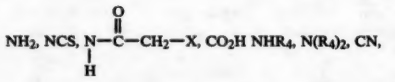
R_1 is hydrogen, alkyl having from one to five carbon atoms, arylalkyl wherein the aryl portion is phenyl or substituted phenyl or phenyl substituted phenyl, alkoxy having from one to five carbon atoms, hydroxyalkyl wherein the alkyl portion has from one to five carbon atoms and having one or more hydroxy groups



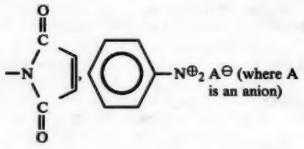


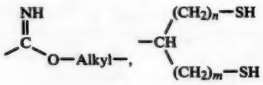


wherein G is



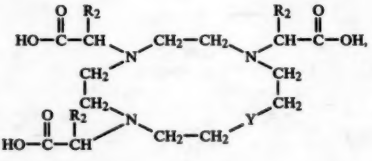
wherein R_4 is alkyl or hydroxyalkyl,





wherein n and m are zero or an integer from one to five, R_2 is hydrogen or alkyl, R_3 is hydrogen, hydroxyalkyl having from one to five carbon atoms and having and one or more hydroxy groups, alkoxy having from one to five carbon atoms, phenyl or substituted phenyl or phenylalkyl or substituted phenylalkyl and X is chloro, bromo or iodo and wherein R_1 is $—(CH_2)_nG$, n is one and R_2 is hydrogen then G is not CO_2H, wherein the term substituted phenyl refers to phenyl groups substituted with one, two, or three halogen, hydroxyl, alkyl, alkoxy carbamoyl or carboxyl groups.

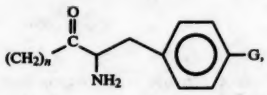
40. A complex, or a pharmaceutically acceptable salt of a complex, of a metal atom and a metal-chelating ligand having the formula

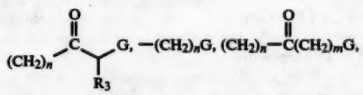


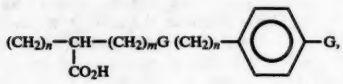
wherein Y is oxygen or

R_1 is hydrogen, alkyl having from one to five carbon atoms,

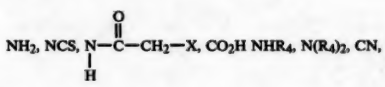
arylalkyl wherein the aryl portion is phenyl or substituted phenyl, phenyl or substituted phenyl, alkoxy having from one to five carbon atoms, hydroxyalkyl wherein the alkyl portion has from one to five carbon atoms and having one or more hydroxy groups



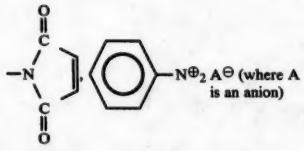


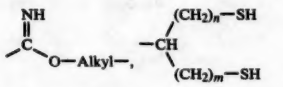


wherein G is



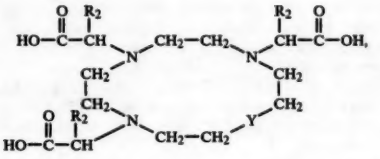
wherein R_4 is alkyl or hydroxyalkyl,





wherein n and m are zero or an integer from one to five, R_2 is hydrogen or alkyl, R_3 is hydrogen, hydroxyalkyl having from one to five carbon atoms and having one or more hydroxy groups, alkoxy having from one to five carbon atoms, phenyl or substituted phenyl or phenylalkyl or substituted phenylalkyl and X is chloro, bromo or iodo and wherein R_1 is $-(CH_2)_nG$, n is one and R_2 is hydrogen then G is not CO_2H, wherein the term substituted phenyl refers to phenyl groups substituted with one, two or three halogen, hydroxy, alkyl, alkoxy carbamoyl or carboxyl groups.

124. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein Y is oxygen or

R_1 is hydrogen, alkyl having from one to five carbon atoms, arylalkyl wherein the aryl portion is phenyl or substituted phenyl, phenyl or substituted phenyl and R_2 is hydrogen or alkyl and wherein the substituted phenyl groups are those substituted with one, two or three halogen, hydroxyl, alkyl, alkoxy, carbamoyl or carboxyl groups.

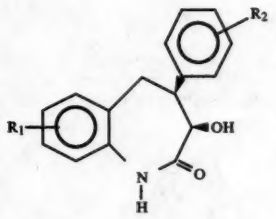
4,885,364

RESOLUTION PROCESS FOR BENZAZEPINE INTERMEDIATES

John K. Thottathil, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

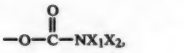
Filed Nov. 23, 1988, Ser. No. 275,493
Int. Cl.[4] C07D *223/16*
U.S. Cl. 540—523 **19 Claims**

1. A process for preparing a resolved cis(+) enantiomer of a compound of the formula

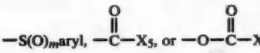


I

wherein R_1 and R_2 are each independently hydrogen, halogen, alkyl, alkoxy, aryloxy, arylalkoxy, diarylalkoxy, arylalkyl, cyano, hydroxy, alkanoyloxy,



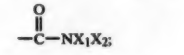
fluoro substituted alkoxy, fluoro substituted alkyl, (cycloalkyl-)alkoxy, $-NO_2$, NX_3X_4, $-S(O)_m$alkyl,



m is 0, 1 or 2;

X_1 and X_2 are each independently hydrogen, alkyl, aryl or heteroaryl, or X_1 and X_2 together with the nitrogen atom to which they are attached are pyrrolidinyl, piperidinyl or morpholinyl;

X_3 and X_4 are each independently hydrogen, alkyl, alkanoyl, arylcarbonyl, heteroarylcarbonyl, or

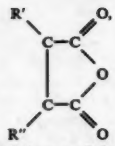


X_5 is hydroxy, alkoxy, aryloxy, amino, alkylamino or dialkylamino; and

X_6 is alkyl, alkoxy or aryloxy; with the proviso that if $R_4$is a 7-alkyl group, it must have a tertiary carbon atom bonded to the ring,

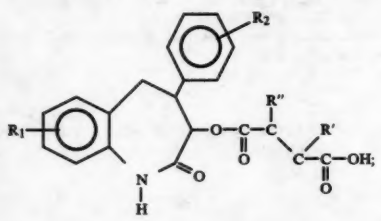
comprising the steps of:

(a) treating a racemic (mixture of the cis(+) and cis(−) enantiomers) compound of formula I with an anhydride of the formula



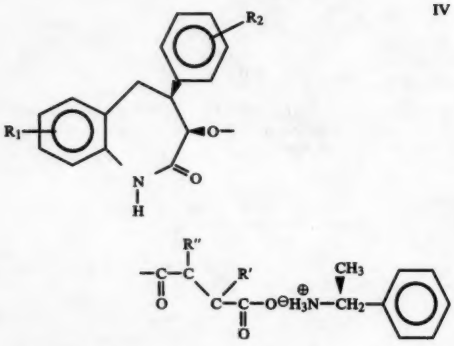
II

p1 wherein R' and R'' are each hydrogen or taken together with the carbons to which they are attached form a benzene ring which may be substituted with nitro or 1, 2, 3 or 4 halogens, to provide a racemic intermediate of the formula



III

(b) treating a compound of formula III, in a solvent with a resolving agent, to provide a mixture of diasteromeric salts from which a compound of the formula



IV

is crystallized; and

(c) treating the compounds of formula IV with a base, in the presence of solvents, to provide the resolved cis(+) enantiomers of formula I.

4,885,365

DITHIOCARBANATE LUBRICANT COMPOSITIONS

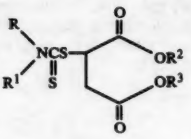
William Y. Lam, Ballwin, Mo., assignor to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Filed May 20, 1988, Ser. No. 196,507

Int. Cl.[4] C07D *265/30, 241/04, 211/60*; C07C *155/08*

U.S. Cl. 544—161 **3 Claims**

1. Compounds having the formula:



wherein:

a. R is an organic radical selected from an aryl group consisting of a benzene or a naphthalene group or an aralkyl group wherein the aryl portion is selected from benzene or naphthalene in which the aryl or aralkyl groups contain up to 15 carbon atoms;

b. R^1 is hydrogen or an organic radical selected from an alkyl group, an alkenyl group, an aryl group consisting of a benzene or a naphthalene group or an aralkyl group consisting of an alkylbenzene or an alkylnaphthalene in which the alkyl or alkenyl groups contain up to 32 carbon atoms and the aryl or aralkyl groups contain up to 15 carbon atoms; or

c. R and R^1 together with the nitrogen atom to which they are attached form a heterocyclic moiety selected from the group consisting of piperidine, morpholine and piperazine; and,

d. R^2 and R^3 are the same or different alkyl groups containing from 1 to 32 carbon atoms each.

4,885,366

NOVEL SELENIUM-CONTAINING MEROCYANINE DYES

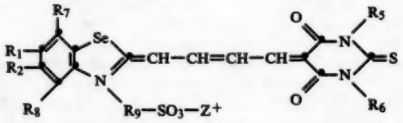
Wolfgang H. H. Gunther, West Chester, Pa., and Frederick J. Sauter, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 8, 1988, Ser. No. 203,843

Int. Cl.[4] C07D *421/06*

U.S. Cl. 544—300 **6 Claims**

1. A compound having the following formula:



wherein:

R_1 and R_2 independently are H, alkyl, alkoxy, or carbocyclic aryl,

R^7 and R^8 are H or

any of R_1 and R_2, R_1 and R_7, and R_2 and R_8 can together comprise the atoms necessary to form a fused 6-membered carbocyclic aromatic ring on the benzene radical to which they are attached;

R_5 and R_6 are independently selected from among the group consisting of alkyl and benzyl of from 1–18 carbon atoms provided that the sum of the carbon atoms in R_5 and R_6 is at least 8;

R_9 is an alkylene group of 2–9 nuclear carbon atoms and CONH-groups; and

Z^+ is a pharmaceutically acceptable cation.

4,885,367
SULFONANILIDE COMPOUNDS

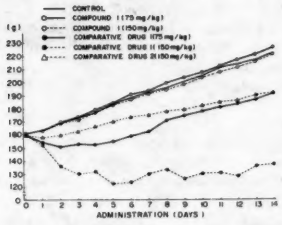
Kensei Yoshikawa; Yutaka Ohuchi, both of Urawa; Kazuto Sekiuchi, Ageo; Shiuji Saito; Katsuo Hatayama, both of Omiya, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed Nov. 16, 1988, Ser. No. 271,641

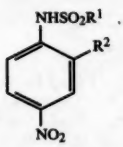
Claims priority, application Japan, Nov. 19, 1987, 62-292856

Int. Cl.[4] C07D *211/46, 335/04, 313/00;* **C07C** *143/78*

U.S. Cl. 546—216 **1 Claim**



1. Sulfonanilide compounds represented by the formula



wherein R^1 is a lower alkyl group or a trifluoromethyl group, R^2 is a cycloalkylidenemethyl group, a group of the formula —A—R^3 (wherein A is an oxygen atom, a sulfur atom, a sulfinyl group or a sulfonyl group and R^3 is a cycloalkyl group having 5–8 carbon atoms; a cycloalkyl group having 5–8 carbon atoms substituted by one or two of a lower alkyl group, an oxo group, a hydroxyl group or a methanesulfonyloxy group; a tetrahydropyranyl group; a tetrahydrothiopyranyl group; or a 1-methylpiperidyl group) or a group of the formula —B—R^4 (wherein B is a carbonyl group, a hydroxymethylene group or a methylene group, R^4 is a cycloalkyl group having 5–8 carbon atoms) and the pharmaceutically acceptable salts thereof.

4,885,368
RADICAL ION SALTS

Siegfried Huenig, Wuerzburg; Alexander Aumueller, Ludwigshafen, and Peter Erk, Gerbrunn, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

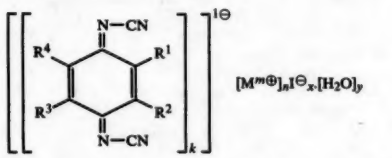
Continuation of Ser. No. 876,399, Jun. 20, 1986, abandoned. This application Nov. 23, 1987, Ser. No. 125,823

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522232

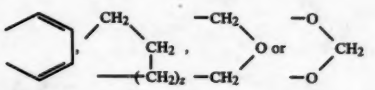
Int. Cl.[4] C07D *241/46, 317/70, 317/44, 413/00*

U.S. Cl. 544—347 **10 Claims**

1. A radical ion salt of the formula:



wherein R^1, R^2, R^3 and R^4 independently of one another are each hydrogen, methyl, ethyl, phenyl, methoxy, ethoxy, fluorine, chlorine or bromine; or R^1 or R^1 and R^3 are each tert-butyl; or R^1 and R^2 or R^3 and R^4 or R^1 and R^2 and R^3 and R^4 together form a radical of the formula:



wherein z is 0, 1, 2 or 3, and wherein the fused aromatic rings are substituted by chlorine, bromine, methyl or methoxy, M^{m+} is a cation whose redox potential is less than or equal to that of silver and which is selected from the group consisting of m-valent alkali metals, copper, silver and tetra-C_1–C_4-alkyl ammonium, tetraphenyl-C_1–C_3-alkyl ammonium, phenyl-C_1–C_3-alkyl-tris-C_1–C_4-alkyl ammonium, C_1–C_4-alkyl-pyridinium, N-(phenyl-C_1–C_3-alkyl)-pyridinium, quinolinium, N-C_1–C_4-alkylquinolinium, N-(phenyl-C_1–C_3-alkyl)-quinolinium, isoquinolinium, N-C_1–C_4-alkylisoquinolinium, N-(phenyl-C_1–C_3-alkyl)-isoquinolinium, phenazinium, N-C_1–C_4-alkylphenazinium or N-(phenyl-C_1–C_3-alkyl)-phenazinium; and wherein k is from 1 to 5, l is from 0.1 to 4, m is from 1 to 3, n is from 0.1 to 4, x is from 0 to 2 and y is from 0 to 6, or k, l, n, x and y are non-integral numbers wherein the number of negative charges on the radical (l^-) plus the number of iodine anions (x) is equal to the number of metal cations multiplied by the number of positive charges per metal cation, thereby ensuring that the radical ion salt is neutral.

4,885,369
PHOTOCONDUCTIVE MATERIAL FOR ELECTROPHOTOGRAPHY COMPRISING RHODANINE DERIVATIVE CHARGE COMPLEX

Toshiyuki Uryu, Tokyo, and Toshihiko Nishiguchi, Osaka, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

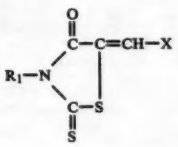
Filed Nov. 30, 1988, Ser. No. 278,237

Claims priority, application Japan, Nov. 30, 1987, 62-301706; Nov. 30, 1987, 62-301716; Nov. 30, 1987, 62-301721; Nov. 30, 1987, 62-301722; Nov. 30, 1987, 62-301723

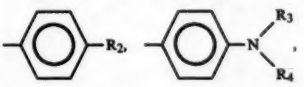
Int. Cl.[4] G03G *5/06, 5/07*

U.S. Cl. 548—183 **4 Claims**

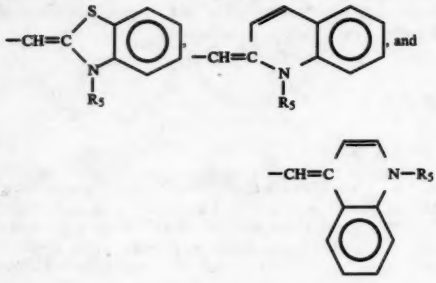
1. A photoconductive material for electrophotography comprising a rhodanine derivative and a halogen-containing polymer, the rhodanine derivative being represented by the following general formula (I)



wherein R_1 represents a substituted or unsubstituted alkyl, aralkyl, aryl or amino group, and X represents a substituent selected from the class consisting of



-continued



in which R_2 represents a lower alkyl group having 1 to 6 carbon atoms, or a hydroxyl group, R_3 and R_4 are identical or different and each represents hydrogen, an alkyl group or an aryl group, and R_5 represents hydrogen, a lower alkyl group having 1 to 6 carbon atoms, an aryl group or a hydroxyl group.

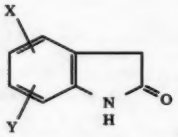
4,885,370

SYNTHETIC METHOD FOR INDOL-2(3H)-ONES

Anthony Marfat, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 24,746, Mar. 11, 1987, Pat. No. 4,761,485.
This application Mar. 17, 1988, Ser. No. 169,794
Int. Cl.[4] C07D *209/34*
U.S. Cl. 548—486 15 Claims

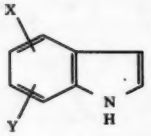
1. A process for the preparation of an oxindole of the formula



(I)

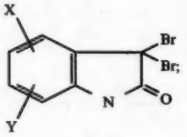
wherein X and Y are each independently hydrogen, (C_1–C_3)alkyl, (C_1–C_3)alkoxy, fluoro, chloro or bromo, which comprises the sequential steps of

(a) reacting an indole of the formula



(II)

with substantially 3 molar equivalents of pyridinium bromide perbromide in a reaction-inert solvent and isolating an intermediate dibromooxindole of the formula



(III)

and either

(b_1) hydrogenating said dibromooxindole over a noble metal catalyst in a reaction-inert solvent to yield said oxindole of the formula (I); or

(b_2) debrominating said dibromooxindole with zinc dust in a lower aliphatic carboxylic acid to yield said oxindole of the formula (I).

4,885,371

PROCESS FOR THE PREPARATION OF PURIFIED N-ALKYL LACTAMS

David J. Tracy, Lincoln Park, and Mohamed M. Hashem, Wayne, both of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

Filed Jun. 22, 1989, Ser. No. 369,966
Int. Cl.[4] C07D *207/267*
U.S. Cl. 548—554 11 Claims

1. The process which comprises reacting a primary amine containing from 1 to 20 carbon atoms with a butyrolactone optionally substituted on a carbon atom with lower alkyl in a mole ratio of from about 0.75:1 to about 1.25:1 in the presence of a catalytic amount of a borohydride salt selected from the group of an ammonium, alkali metal and alkaline earth metal salt of a borohydride or mixtures thereof to produce the corresponding lactam product.

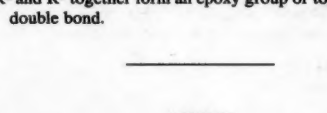
4,885,372

CYCLOPENTANE DERIVATIVES, METHODS FOR PRODUCING THEM AND THEIR USE

Bernhard Riefling, Darmstadt, and Hans Witzel, Dieburg, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 19, 1986, Ser. No. 909,745
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1985, 3533576
Int. Cl.[4] C07F *7/08*; C07D *303/02*
U.S. Cl. 549—215 9 Claims

1. A cyclopentane derivative of the formula



wherein

R^1 is H or a hydroxyl protective group, and

R^2 and R^3 together form an epoxy group or together form a double bond.

4,885,373

2,4,5,6,7,8-HEXAHYDRONAPHTHO[2,3-B]FURAN USEFUL AS AN INTERMEDIATE

Jean L. Peglion, Le Vesinet; Jean C. Poignant, Bures sur Yvette, and Joel Vian, Chaville, all of France, assignors to ADIR Et Cie, Neuilly-sur-Seine, France

Division of Ser. No. 173,285, Mar. 25, 1988, Pat. No. 4,863,951.
This application Jan. 27, 1989, Ser. No. 303,545
Claims priority, application France, Apr. 1, 1987, 87 04551
Int. Cl.[4] C07D *307/92*
U.S. Cl. 549—458 1 Claim

1. 2,3,5,6,7,8-Hexahydronaphtho[2,3-b]furan-5-one.

4,885,374

ALKYLENE OXIDES PRODUCTION FROM ALKANES OR ALKYLAROMATICS USING MOLTEN NITRATE SALT CATALYST

B. Timothy Pennington, Sulphur, La., assignor to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 929,552, Nov. 12, 1986, Pat. No. 4,785,123. This application Aug. 31, 1988, Ser. No. 238,714
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] C07D *301/06*
U.S. Cl. 549—532 9 Claims

1. A process for producing an alkylene oxide or mixture of alkylene oxides by a reaction which comprises reacting an alkane or alkylaromatic compound having from 3 to 22 carbon atoms per molecule, or mixture thereof, with an oxygen-containing gas, said alkane or alkylaromatic compound and said oxygen-containing gas being gaseous reactants, by contacting said gaseous reactants with a bath, stream, spray or mist of at least one molten nitrate salt catalyst, said catalyst being present in an amount sufficient to absorb any heat generated during said reaction while maintaining an essentially constant reaction temperature, said reaction being conducted at a reaction temperature of between about 135° C. and about 600° C. and a reaction pressure of between about 1 and about 50 atmospheres.

4,885,375

RESOLUTION OF 3-(4-METHOXYPHENYL)GLYCIDIC ACID WITH IN SITU CONVERSION TO ALKYL ESTERS

Hans Wynberg, Groningen, and Wolter ten Hoeve, Eelde, both of Netherlands, assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed May 18, 1988, Ser. No. 195,749
Int. Cl.[4] C07D *303/18*
U.S. Cl. 549—557 17 Claims

1. A method comprising contacting a racemic or optically enriched sample of a 3-(4-methoxyphenyl)glycidic acid alkyl ester with an alkali metal hydroxide in a protic liquid medium at a low temperature, then contacting same with a suitable resolving agent, then adding a suitable acid to the foregoing mixture, at a low temperature, to form the corresponding diastereomeric salts, separating desired diastereomeric salt from the mixture, and transforming at least one of the diastereomeric salts to corresponding ester by converting diastereomeric salt into corresponding alkali metal salt by contacting the diastereomeric salt with an alkali metal base and then akylating the corresponding alkali metal salt with a suitable alkylating agent, by steps under conditions such that 3-(4-methoxyphenyl)glycidic acid alkyl ester of high enantiomeric purity is prepared.

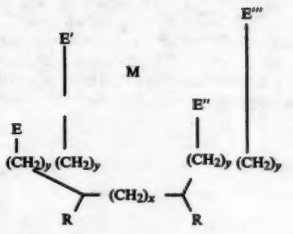
4,885,376

NEW TYPES OF ORGANOMETALLIC REAGENTS AND CATALYSTS FOR ASYMMETRIC SYNTHESIS

John G. Verkade, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 13, 1987, Ser. No. 107,347
Int. Cl.[4] C01G *55/00, 23/00, 53/00*
U.S. Cl. 556—18 9 Claims

1. Chiral catalysts having quadriped ligands for induction of chirality in reaction product molecules, said catalysts having the formula:



wherein M is a transition metal selected from the group consisting of palladium, rhodium, platinum, nickel, titanium, zirconium and hafnium, E, E', E'', and E''' corners are selected from the group consisting of organo electron donor moieties of phosphorus, nitrogen, arsenic, oxygen, sulfur, wherein y is from about 1 to about 3, x is from 0 to about 4, R and R' are selected from the group consisting of hydrogen, C_1 to C_{10} alkyl, phenyl, and ring systems wherein R and R' are $(CH_2)_z$ and z is from 1 to 4.

4,885,377

OLEFIN AND ALKANE OXIDATIONS, RUTHENIUM CARBOXYLATE CATALYST THEREFOR AND METHOD OF PREPARATION THEREOF

Russell S. Drago, and Shannon Davis, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Jan. 22, 1988, Ser. No. 147,302
Int. Cl.[4] C07F *15/00*
U.S. Cl. 556—136 4 Claims

1. A composition of matter comprising a cation of the formula:

$$Ru_3O[OCO(CF_2)_yCF_3]_6L_x^{x+}$$

Wherein:
Ru are ruthenium atoms having a formal oxidation state of +2 or +3,
L is a neutral or anionic ligand,
y is an integer from 0 to 6,
x is an integer from 1 to 3; and an anion.

4,885,378

PREPARATION OF HEXAALKYLCYCLOTRISILTHIANE

Elliot I. Band, North Tarrytown, N.Y., and Suzanne T. Eberhart, New Haven, Conn., assignors to Akzo America Inc., New York, N.Y.

Filed May 4, 1989, Ser. No. 347,309
Int. Cl.[4] C07F *7/08*
U.S. Cl. 556—426 7 Claims

1. A process for preparing and recovering a hexaalkylcyclotrisilthiane which comprises the reaction of dilithium sulfide and a dihalodialkylsilane in a non-oxygenated solvent and recovering the hexaalkylcyclotrisilthiane.

4,885,379

NEUTRALIZED ALKYL ETHER SULFURIC ACID HALF-ESTER COMPOSITIONS CONTAINING POLYHYDROXY OLIGOMERS

Phillip G. Abend, Fort Lee, N.J., assignor to Henkel Corporation, Ambler, Pa.

Filed Apr. 12, 1988, Ser. No. 180,408
Int. Cl.[4] C09C *141/08*
U.S. Cl. 558—34 7 Claims

1. A process for the neutralization of an alkyl ether sulfuric acid half-ester of the formula

$RO(CH_2CH_2O)_nSO_3H$

wherein R is C_{10}–C_{20} alkyl and n is from 1 to 7, comprising neutralizing the half-ester with a neutralizing agent in aqueous solution in the presence of a polyhydroxy oligomer selected from the group consisting of a polyglycerol or a hydrogenated, hydrolyzed polysaccharide to provide the corresponding half-ester salt.

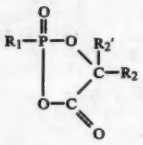
4,885,380

PROCESS FOR PREPARING PHOSPHONYLOXYACYL AMINO ACIDS AND DERIVATIVES THEREOF

John K. Thottathil, 585 Flock Rd., Trenton, N.J. 08690

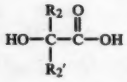
Division of Ser. No. 839,256, Mar. 13, 1986, abandoned. This application Aug. 26, 1988, Ser. No. 237,490
Int. Cl.[4] C07F 9/21
U.S. Cl. 558—83 5 Claims

1. A process for preparing a phosphonic acid intermediate which is a cyclic mixed anhydride of the structure



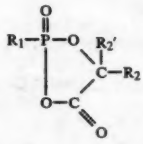
wherein R_1 is lower alkyl, aminoalkyl, haloalkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl and R_2 is H, lower alkyl, aminoalkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl and $R_{2'}$ is H, which comprises treating a phosphonic acid dichloride of the structure

with an α-hydroxy acid of the structure



at a temperature within the range of from about −85° C. to about −65° C., employing a molar ratio of dichloride:acid of within the range of from about 3:1 to about 0.5:1 in the presence of an organic base, to form the cyclic mixed anhydride.

4. A phosphonic acid intermediate having the structure



wherein R_1 is lower alkyl, aminoalkyl, haloalkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl; R_2 is H, lower alkyl, aminoalkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl; and $R_{2'}$ is H.

4,885,381

PHOSPHATE-PHOSPHITES ACID HALIDES

Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 849,590, Apr. 8, 1986, Pat. No. 4,755,547. This application Apr. 11, 1988, Ser. No. 179,793
Int. Cl.[4] C07F 9/14
U.S. Cl. 558—155 6 Claims

1. An acid halide of a halogenated phosphate-phosphite.

4,885,382

METHOD OF PRODUCING TETRAKIS[3,5-DI-TERT-BUTYL-4-HYDROXYPHENYL)-PROPIONYLOXYMETHYL]METHANE

Masayoshi Gohbayashi, Nakatsu; Noritsugu Narita, Suzuka, and Makoto Maruno, Mie, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP88/00087, § 371 Date Sep. 28, 1988, § 102(e) Date Sep. 28, 1988, PCT Pub. No. WO88/05772, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 1, 1988, Ser. No. 261,963
Claims priority, application Japan, Feb. 3, 1987, 62-24162
Int. Cl.[4] C07C 69/76
U.S. Cl. 560—75 4 Claims

1. A method of producing tetrakis[3-(3,5-di-tert-butyl4-hydroxyphenyl)propionyloxymethyl]methane by ester exchange between a 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionic acid alkyl ester and pentaerythritol in the presence of a basic catalyst, which comprises carrying out the reaction in the presence of a 3-(3-tert-butyl-4-hydroxyphenyl)propionic acid alkyl ester.

4,885,383

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACID METHYL ESTERS

Jurgen Weber; Helmut Springer, both of Oberhausen, and Peter Lappe, Dinslaken, all of Fed. Rep. of Germany, assignors to Hoeschst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 248,544
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732995
Int. Cl.[4] C07C 67/03
U.S. Cl. 560—103 13 Claims

1. A process for the preparation of methyl carboxylate comprising reacting a saturated or unsaturated, straight or branched chain, mono or dicarboxylic acid having more than 5 carbon atoms with a molar excess of methanol over said acid in the presence of an acid catalyst taken from the class consisting of mono and multibasic, non volatile, inorganic and organic acids and acid salts at a temperature of 100° to 150° C. and below the boiling point of said carboxylate.

4,885,384

PROCESS FOR THE CARBONYLATION OF IODOAROMATIC COMPOUNDS

Guy R. Steinmetz, 835 Sir Echo Dr.; Kevin J. Edgar, 1010 Olympus Cir., and Stephen N. Falling, 225 Woodstock Pl., all of Kingsport, Tenn. 37663

Filed Mar. 14, 1988, Ser. No. 168,050
Int. Cl.[4] C07C 51/10
U.S. Cl. 562—406 14 Claims

1. A process for the production of an aromatic carboxylic acid which comprises carbonylating an iodoaromatic compound in the presence of carbon monoxide, a catalytic amount of palladium and a Bronsted base in a mixture of a carboxylic acid and water under aromatic carboxylic acid forming conditions of temperature and pressure.

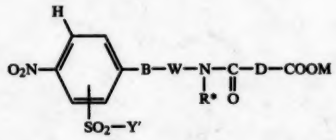
4,885,385

SULFONYL CONTAINING COMPOUNDS SUITABLE AS PRECURORS FOR WATER-SOLUBLE FIBER-REACTIVE TRIPHENDIOXAZINE COMPOUNDS

Hartmut Springer, Königstein/Taunus; Walter Helmling, Hofheim am Taunus, and Günther Schwaiger, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 13,974, Feb. 12, 1987, Pat. No. 4,774,333.
This application Jul. 28, 1988, Ser. No. 225,545
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628084
Int. Cl.[4] C07C *147/11, 147/12, 147/13*
U.S. Cl. 562—430 11 Claims

1. A compound of the formula



in which

B is an oxygen or sulfur or amino group or the formula —NH— or —N(R')—, in which R' is alkyl of 1 to 6 carbon atoms;

R^* is hydrogen or alkyl of 1 to 4 carbon atoms unsubstituted or substituted by one or two substituents selected from the group consisting of: chlorine; alkoxy of 1 to 4 carbon atoms; benzoylamino; sulfobenzoylamino; alkanoylamino of 2 to 5 carbon atoms; hydroxy; sulfato; phosphato; alkanoyloxy of 2 to 5 carbon atoms; sulfo; carboxy; phenyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, nitro, sulfamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl or alkyl of 1 to 4 carbon atoms and phenyl, and carbamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl or alkyl of 1 to 4 carbon atoms and phenyl; and naphthyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, nitro, sulfamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl or alkyl of 1 to 4 carbon atoms and phenyl; or

R^* is phenyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, nitro, sulfamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl or alkyl of 1 to 4 carbon atoms and phenyl, and carbamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms or phenyl or alkyl of 1 to 4 carbon atoms and phenyl, or R^* is naphthyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, nitro, sulfamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl or alkyl of 1 to 4 carbon atoms and phenyl, and carbamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms or phenyl or alkyl of 1 to 4 carbon atoms and phenyl;

W is a bivalent group selected from an aliphatic group or a (C_5–C_{10})-cycloaliphatic group unsubstituted or substituted by C_1–C_4-alkyl, or from an aliphatic-(C_5–C_8)-cycloaliphatic group unsubstituted or substituted by C_1–C_4-alkyl in the cycloaliphatic moiety and unsubstituted or substituted in the aliphatic moiety by one or two substituents selected from the group consisting of: chlorine; alkoxy of 1 to 4 carbon atoms; benzoylamino; sulfobenzoylamino; alkanoylamino of 2 to 5 carbon atoms; hydroxy; sulfato; phosphato; alkanoyloxy of 2 to 5 carbon atoms; sulfo; carboxy; phenyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, nitro, sulfamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl or alkyl of 1 to 4 carbon atoms and phenyl, and carbamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl or alkyl of 1 to 4 carbon atoms and phenyl;

or from those groups which aliphatic radicals are interrupted by hetero groups which are selected from the groups —O—, —S—, —SO_2—, —CO—, 1,4-piperidino, —NH— and —N(R')—, wherein R' has one of the meanings of R' or is an alkanoyl of 2 to 5 carbon atoms;

D is a straight-chain or branched alkenylene of 2 to 8 C-atoms or an alk-dien-ylene of 4 to 8 C-atoms, and

Y' is vinyl, or is an ethyl substituted by an alkali-eliminable substituent in the β-position, or is β-hydroxyethyl, and

M is hydrogen, an alkali metal or one equivalent of an alkaline earth metal.

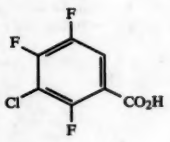
4,885,386

PROCESS FOR THE SYNTHESIS OF 3-CHLORO-2,4,5-TRIFLUOROBENZOIC ACID

James N. Wemple; Gregory L. Karrick, and Floyd G. Spence, all of Holland, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 28, 1988, Ser. No. 264,296
Int. Cl.[4] C07C *51/363*
U.S. Cl. 562—493 12 Claims

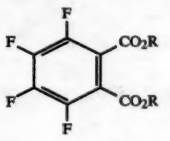
1. A process for the preparation of a compound of Formula I



I

which comprises:

(a) reacting a compound of Formula IV



IV

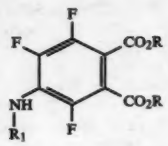
wherein R is alkyl of from one to eight carbon atoms with

(1) a compound of Formula

R_1NH_2

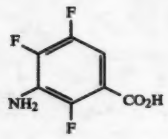
wherein R_1 is tertiary butyl, tertiary pentyl, benzyl, or para methoxybenzyl in a polar aprotic solvent at about 0? C. to about 80? C. and

(2) reacting the resulting intermediate of Formula III



III

wherein R and R_1 are as defined above, in situ with an aqueous acid at about 70° C. to about 140° C. to afford a compound of Formula II



II

(b) finally reacting a compound of Formula II with sodium nitrite and the resulting solid mixture added to an aqueous solution of cupric chloride in aqueous hydrochloric acid at about 0° C. to about 90° C. for about 0.5 to about five hours to give after extraction with an inert, water immiscible solvent a compound of Formula I.

4,885,387

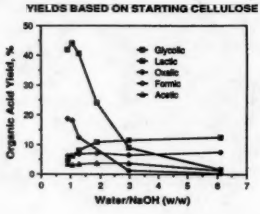
PRODUCTION OF HIGH YIELDS OF GLYCOLIC AND OXALIC ACIDS FROM POLYSACCHARIDE-CONTAINING MATERIALS

John M. Krochta, El Cerrito, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 12, 1988, Ser. No. 155,442

Int. Cl.[4] C07C *51/295, 51/31, 55/06, 59/06*

U.S. Cl. 562—515 **12 Claims**



1. A method for treating a polysaccharide-containing material to produce organic acids, or salts thereof, which comprises reacting a polysaccharide-containing material with a concentrated aqueous alkaline solution at elevated temperatures in a closed system, wherein the weight ratio of water-to-alkali in said aqueous alkaline solution is 0.8/1 to 3/1, thereby yielding a product mixture comprising alkaline salts of glycolic, oxalic, lactic, formic, and acetic acids.

4,885,388

2-METHYL-4-FLUORO-PHENOLS AND THEIR PREPARATION

Albrecht Marhold, Leverkusen, and Reiner Fischer, Monheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

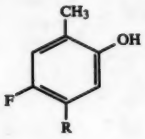
Filed Sep. 12, 1988, Ser. No. 243,386

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731527

Int. Cl.[4] C07C *85/11, 37/00*

U.S. Cl. 564—417 **16 Claims**

1. 2-Methyl-4-fluoro-phenols of the formula



in which

R represents NO_2 or NH_2.

4,885,389

PROCESS FOR MANUFACTURING P-AMINOPHENOL

Lain-tze Lee; Mei H. Chen, and Chung-Niang Yao, all of Hsin, Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Jun. 8, 1987, Ser. No. 59,738

Int. Cl.[4] C07C *85/11*

U.S. Cl. 564—418 **19 Claims**

1. A process for preparing p-aminophenol which comprises: catalytically hydrogenating nitrobenzene in an acidic aqueous reaction medium containing from 10 to 25% sulfuric acid in the presence of from 0.1 to 1%, based on the weight of aqueous medium, of an organic acid.

4,885,390

ALKOXYLATED ETHYLENE GLYCOL DIAMINE BOTTOMS PRODUCTS FOR RIGID URETHANE FOAMS

George P. Speranza; Michael E. Brennan, both of Austin, and Jiang-Jen Lin, Round Rock, all of Tex., assignors to ARCO Chemical Technology, Inc., Wilmington, Del.

Filed Oct. 30, 1987, Ser. No. 117,559

Int. Cl.[4] C07C *89/02*

U.S. Cl. 564—475 **12 Claims**

1. Amino polyols prepared by the process comprising reacting an alkylene oxide with ethylene glycol diamine bottoms products, where the alkylene oxide is selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide and mixtures thereof.

4,885,391

PRODUCTION OF C_4 TO C_{12} AMINES

Frank E. Herkes, La Place, La., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jan. 14, 1988, Ser. No. 143,834

Int. Cl.[4] C07C *85/12*

U.S. Cl. 564—491 **5 Claims**

1. A hydrogenation process for the conversion of 2-methylglutaronitrile to the corresponding amine which comprises reacting a mixture consisting of 2-methylglutaronitrile, 0.5 to 4% by weight water, and hydrogen, by contacting said mixture with a catalyst of Raney cobalt containing chromium as a promoter, at a temperature of about 80° to 150° C. and at a pressure of about 400 to 2500 psig, and recovering the amine.

4,885,392

DERIVATIVES OF 1,3-BISSUBSTITUTED 2-PROPANOL CONTAINING AMINO GROUPS, METHODS FOR THEIR PREPARATION AND THEIR USE

Rüdiger Lenz, Frankfurt am Main; Gerd Walz, Wiesbaden; Michael Hönel, and Peter Ziegler, both of Mainz, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

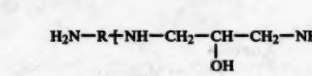
Filed Dec. 22, 1987, Ser. No. 136,813

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644371

Int. Cl.[4] C07C *91/04, 91/12, 149/18*

U.S. Cl. 564—503 5 Claims

1. A derivative of 1, 3-bissubstituted-2-propanol containing amino groups of the formula (I)



(I)

in which:

in which

Z^2=O, S, NH, N-alkyl containing up to 8 carbon atoms, N-phenyl, N-mono-, di- or -trialkyl phenyl containing 1 to 4 carbon atoms per alkyl group, and/or a chemical bond,

R^6 to R^6 =H, CH_3, C_2H_5, phenyl or mono-, di- or trialkyl-phenyl containing 1 to 4 carbon atoms per alkyl group,

n, m, l=0 to 12, the sum of n+m+l being >4

k=1 to 6,

p=1 to 5.

4,885,393

NOVEL S-BUTYL-DI-N-ALKYL PHOSPHINES, PHOSPHINE OXIDES AND PHOSPHINE SULFIDES, AND PROCESSES FOR MAKING THEM

Norbert Weferling, Hürth, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

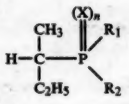
Continuation of Ser. No. 77,222, Jul. 24, 1987, abandoned. This application Apr. 17, 1989, Ser. No. 339,163

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626969

Int. Cl.[4] C07F *9/50, 9/53*

U.S. Cl. 568—8 7 Claims

1. Sec-butyl-di-n-alkyl phosphine, phosphine oxide or phosphine sulfide of the formula



in which R_1 and R_2 each is each a linear, unsubstituted alkyl chain having 5, 6, 8 or 10 carbon atoms, X is oxygen or sulfur, and n is zero or 1.

4,885,394

PROCESS FOR THE PREPARATION OF TERTIARY PHOSPHINE OXIDES

Jürgen Svara, Cologne, and Norbert Weferling, Hürth, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,691

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737938

Int. Cl.[4] C07F *9/02*

U.S. Cl. 568—14 4 Claims

1. A process for the preparation of tertiary phosphine oxide of the general formula

(I)

in which R is a member selected from the group consisting of linear alkyl, branched alkyl, alkenyl, cyclic alkyl, polycyclic alkyl, polycyclic alkenyl, arylalkyl, and alkylaryl groups having from 1 to 24 carbon atoms, and n stands for 1 or 2, which comprises reacting phosphine of the general formula

(II)

in which R has the meanings given above and R_1 is a member selected from the group consisting of hydrogen, linear alkyl, branched alkyl, alkenyl, cyclic alkyl, polycyclic alkyl, polycyclic alkenyl, aryalkyl, and alkylaryl groups having from 1 to 24 carbon atoms, with dimethyl carbonate under pressure from 2 to 100 bar and a temperature from 150° to 250° C.

4,885,395

PREPARATION OF ALPHA, BETA-UNSATURATED KETONES

Wolfgang Hoelderich, Frankenthal; Kurt Schneider, Bad Duerkheim, and Leopold Hupfer, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

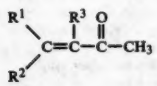
Filed Sep. 25, 1987, Ser. No. 100,846

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632530

Int. Cl.[4] C07C *45/66*

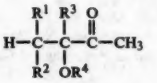
U.S. Cl. 568—314 13 Claims

1. A process for the preparation of an alpha, beta-unstaturated ketone of the formula I



(I)

where R^1, R^2 and R^3 are each hydrogen, alkyl, alkenyl of 1 to 12 carbon atoms, cycloalkyl, aryl, aralkyl or alkylaryl, which in turn may be substituted, or R^1 and R^3 or R^2 and R^3 together with the carbon atoms to which they are bonded may form a cycloalkane or cycloalkene radical, wherein a hydroxy- alkoxy- or carboxyketone of the formula II



(II)

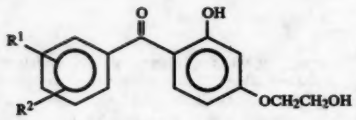
where R^1, R^2 and R^3 have the above meanings and R^4 is hydrogen, alkyl or carboxyl, is converted in the gas phase at a temperature of from 100° to 500° C. in the presence of an acidic catalyst selected from the group consisting of a zeolite, a phosphate, a metal oxide and phosphoric acid on a carrier.

4,885,396
PROCESS FOR THE PREPARATION OF 2-HYDROXY-4-(2'-HYDROXYETHOXY) BENZOPHENONES

Erwin Hahn, Heidelberg, and Peter Neumann, Wiesloch, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 197,042
Int. Cl.[4] C07C 45/71
U.S. Cl. 568—315 13 Claims

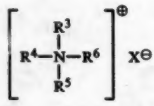
1. A process for the preparation of 2-hydroxy-4-(2,-hydroxyethyoxy)benzophenones having a structure (FIG. I),



(I)

wherein either R group is hydrogen, hydroxyl, hydroxyethoxy, fluorine, chlorine, bromine, cyanide; a C_1–C_8 alkyl; a C_1–C_8 alkoxy; a C_4–C_7 cycloalkyl; a C_1–C_4 alkyl, substituted with one or more fluorine, chlorine or bromine, or one of the following phenoxy, benzyl or phenyl substituted by fluorine, chlorine, bromine, a C_1–C_4 alkyl, or a C_1–C_4 alkoxy comprising: reacting a 2,4-dihydroxybenzophenone having a structure (FIG. II),

wherein R^1 and R^2 are any of the aforementioned substituents, with ethylene carbonate, in the presence of a quaternary ammonium salt catalyst, wherein the quaternary ammonium salt has a structure (FIG. III)



in which

X^- is an inorganic or organic anion equivalent R^3, R^4 may be C_1 to C_{18} alkyl, C_5 to C_6 cycloalkyl, phenyl or benzyl,
R^5 may be a C_1 to C_{18} alkyl or benzyl and,
R^6 may be C_1 to C_{18} alkyl,
R^3 and R^4 may form a 5 member ring; or
R^3 and R^4 may form a 6 member ring, at elevated temperatures,

and subsequently isolating a finished product from said reaction mixture.

4,885,397
PROCESS FOR THE PREPARATION OF CYCLIC KETONES BY ISOMERIZATION OF EPOXIDES

Wilfried Buescher, Haltern, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 14, 1988, Ser. No. 244,070
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744094
Int. Cl.[4] C07C 45/51
U.S. Cl. 568—341 14 Claims

1. A process for preparing a cyclic keytone from a cyclic epoxide, comprising the step of:

contacting a cyclic epoxide with an alkali or alkaline-earth halide salt in the presence of a polar solvent selected from the group consisting of N,N'-disubstituted dialkyl carboxylic acid amides, N-substituted lactams, N,N,N',N'-tetrasubstituted ureas and N,N'-disubstituted cyclic ureas at a temperature ranging from 120° to 250° C., wherein said cyclic epoxide is unsubstituted or substituted with one or more C_{1-5} alkyl or alkenyl groups, and wherein said cyclic epoxide comprises 7–20 ring carbon atoms, and contains 0–5 carbon-carbon multiple bonds.

4,885,398
PROCESS FOR PRODUCING HEXAFLUOROACETONE OR ITS HYDRATE

Takehiro Sonoi, Ohtsu; Toshimasa Sagawa, Nakago; Okimasa Yamada, Isohara, and Tetsuya Mizuno, Kitaibaraki, all of Japan, assignors to Nippon Mektron Limited, Tokyo, Japan

Filed May 2, 1988, Ser. No. 189,034
Int. Cl.[4] C07C 45/40
U.S. Cl. 568—404 4 Claims

1. A process for producing hexafluoroacetone or its hydrate which comprises reacting a compound having the formula

$$(CF_3)_2C{=}CFOR$$

wherein R is selected from the group consisting of a C_1–C_{10} alkyl group, an aryl group and a benzyl group, with an oxygen-containing gas having an ozone concentration of 2.5 to 400 mg per liter and at a temperature of −70° to 110° C.

4,885,399
PROCESS FOR OBTAINING SUBSTANTIALLY ALDEHYDE-FREE KETONE PRODUCTS

Stanley F. Newman, Walnut Creek; Jacques C. De Deken, Palo Alto, and Michael L. Cook, Sunnyvale, all of Calif., assignors to Catalytica, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 120,683, Nov. 12, 1987, abandoned, which is a continuation of Ser. No. 935,281, Nov. 26, 1986, abandoned. This application Jul. 13, 1988, Ser. No. 218,693
Int. Cl.[4] C07C 45/85
U.S. Cl. 568—410 62 Claims

1. A method for removing aldehydes from a mixture of aldehydes and ketones which comprises the steps of:

(a) providing to a reactor a substantially water-free mixture of aldehydes and ketones;
(b) providing to said reactor a Tischtschenko catalyst selected from the group consisting of multi-valent metal alkoxides of the form $[M(OR)_n]$, where M is a Group IIB, Group IIIA or Group IVB metal, R is an alkyl group, and n is equal to the valence state of metal M;
(c) contacting said substantially water-free aldehyde and ketone mixture with said provided Tischtschenko catalyst to thereby condense said aldehydes into esters, wherein said esters have a boiling point significantly different from said ketone; and,
(d) separating said esters and Tischtschenko catalyst from said ketone mixture.

4,885,400
PRODUCTION PROCESS OF 2-CHLOROPROPIONALDEHYDE

Hiroshi Ono, and Takaharu Kasuga, both of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

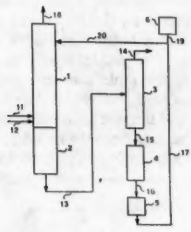
PCT No. PCT/JP87/00320, § 371 Date Dec. 1, 1987, § 102(e) Date Dec. 1, 1987, PCT Pub. No. WO87/07262, PCT Pub. Date Dec. 3, 1987

PCT Filed May 20, 1987, Ser. No. 145,759

Claims priority, application Japan, May 20, 1986, 61-113543; May 20, 1986, 61-113545; May 22, 1986, 61-116140

Int. Cl.[4] C07C 45/50

U.S. Cl. 568—454 1 Claim



1. In a continuous process for producing 2-chloropropionaldehyde, comprising the steps of:

(a) reacting vinyl chloride, carbon monoxide and hydrogen in the presence of a rhodium compound, a base, a water insoluble or barely soluble organic solvent and water at a temperature of 20° to 150° C. and a pressure of 1 to 200 kg/cm^2 to obtain a reaction mixture containing 2-chloropropionaldehyde.

(b) separating said reaction mixture into a water phase and an organic phase,

(c) separating and obtaining 2-chloropropionaldehyde from said water phase so as to reduce the concentration of 2-chloropropionaldehyde in said water phase to not higher than 5 weight percent,

(d) subjecting said water phase separated from 2-chloropropionaldehyde in step (c) to an anion exchange treatment to obtain regenerated water, and

(e) circulating said regenerated water to said step (a) to use it repeatedly together with said organic phase,

the improvement wherein said solvent has a specific gravity lower than that of water and the reaction is carried out in a recorder composed of a reaction zone equipped with a stirrer in the upper part and a gravity settling separation zone provided beneath said reaction zone while continuously withdrawing said water phase containing the resulting 2-chloropropionaldehyde from the lower part of the gravity settling separation zone to continuously circulate said water phase to the upper part of said reaction zone after being subjected to said steps (c) to (e).

4,885,401
BIS-PHOSPHITE COMPOUNDS

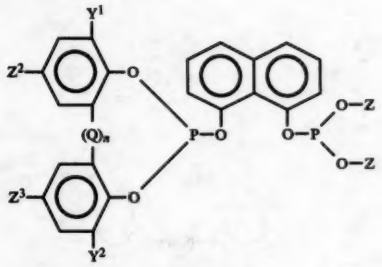
Ernst Billig; Anthony G. Abatjoglou, both of Charleston, and David R. Bryant, South Charleston, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

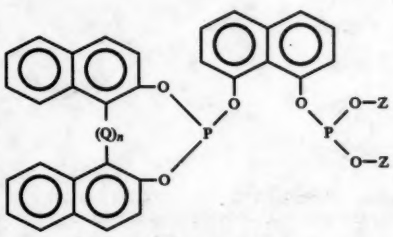
Division of Ser. No. 772,891, Sep. 5, 1985. This application Mar. 31, 1988, Ser. No. 176,346

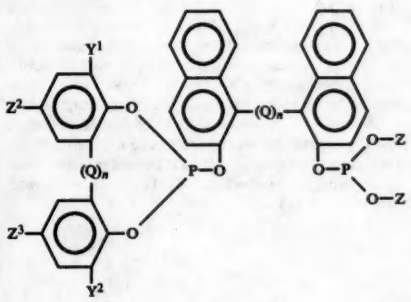
Int. Cl.[4] C07C 45/50; C07F 9/02

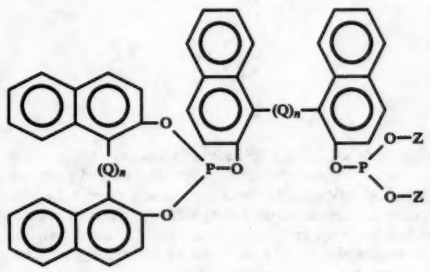
U.S. Cl. 568—454 12 Claims

1. A process for carbonylation comprising reacting an organic compound capable of being carbonylated with carbon monoxide in the presence of a Group VIII transition metal-bisphosphite complex catalyst consisting essentially of a Group VIII transition metal complexed with carbon monoxide and a bis-phosphite ligand selected from the class consisting of the formulas









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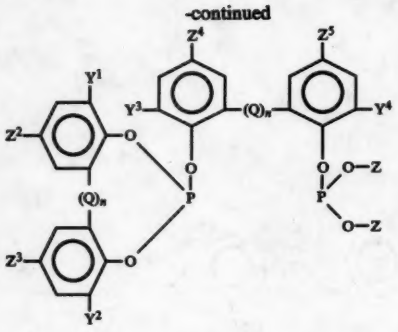
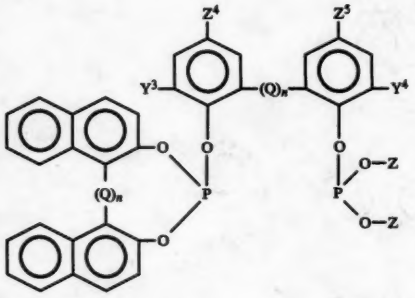
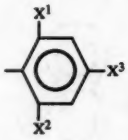


(XI)



(XII)

wherein in said Formulas VII, VIII, IX, X, XI and XII, Q is $—CR^1R^2$ wherein each R^1 and R^2 radical individually represents a radical selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms phenyl, tolyl and anisyl, wherein each Y^1, Y^2, Y^3, Y^4, Z^2, Z^3, Z^4 and Z^5 group individually represents a radical selected from the group consisting of hydrogen, an alkyl radical having from 1 to 18 carbon atoms, phenyl, benzyl, cyclohexyl, 1-methylcyclohexyl, cyano, halogen, nitro, trifluoromethyl, hydroxy, carbonyloxy, amino, acyl, phosphonyl, oxycarbonyl, amido, sulfinyl, sulfonyl, silyl, alkoxy, and thionyl radicals and wherein each Z group individually represents an identical or different radical selected from the group consisting of unsubstituted alkyl radicals and an aryl radical having the Formula:



wherein each X^1, X^2, and X^3 radical individually represents a radical selected from the group consisting of hydrogen, an alkyl radical having 1 to 18 carbon atoms, phenyl, benzyl, cyclohexyl, 1-methylcyclohexyl, cyano, halogen, nitro, trifluoromethyl, hydroxy, carbonoxy, amino, acyl, phosphonyl, oxycarbonyl, amido, sulfinyl, silyl, alkoxy and thionyl radicals; and wherein n has a value of 0 or 1.

4,885,402

PROCESS FOR PREPARING NONIONIC SURFACTANTS FROM GLYCEROL MONOCHLOROHYDRIN, IN AN AROMATIC SOLVENT MEDIUM, PRODUCTS OBTAINED AND COMPOSITIONS CONTAINING THEM

Henri Sebag, Paris, France, assignor to L'Oreal, Paris, France

Filed Jun. 3, 1988, Ser. No. 201,742

Claims priority, application France, Jun. 5, 1987, 87 07956

Int. Cl.[4] C07C *43/11*

U.S. Cl. 568—620 **12 Claims**

1. A single stage process for preparing a water-soluble or water-dispersible polyglycerolated nonionic surfactant comprising

condensing glycerol monochlorohydrin with a (poly)hydroxylated organic compound selected from the group consisting of an alkylphenol, a 1,2-alkanediol, a polyethoxylated fatty alcohol, a polyethoxylated alkylphenol and a (poly) glycerol ether in the presence of a strong base, and in the presence of an aromatic solvent at a temperature below 150° C., the mole ratio of said glycerol monochlorohydrin to said polyhydroxylated compound being greater than 1 and the said aromatic solvent being present in an amount ranging from 0.4 to 1.5 parts by weight per 1 part by weight of said (poly)hydroxylated organic compound, and removing water as it forms by distillation.

4,885,403

PROCESS FOR MAKING PROPARGYL ETHERS OF BISPHENOLS

Muthiah N. Inbasekaran, Midland, and Stoil K. Dirlikov, Ypsilanti, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 56,190, Jun. 1, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 225,699

Int. Cl.[4] C07C *41/00, 43/20*

U.S. Cl. 568—631 **30 Claims**

1. A process for preparing a propargyl ether comprising the step of:

reacting a hydroxy aromatic compound with a propargyl halide having the formula $HC{\equiv}C—CH_2X$, where X is Cl, Br or I, in an aqueous solution of an alkaline agent in the presence of phase transfer catalyst, being quarternary salt, poly(ethylene glycol), poly(ethylene glycol alkylether), macrocyclic polyether or cryptate under reaction conditions sufficient to produce the propargyl ether directly in excellent purity and in high yields without significant contamination of carbon alkylated materials.

4,885,404

FLURBIPROFEN INTERMEDIATE

Peter G. M. Wuts, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

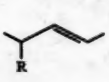
PCT No. PCT/US86/01275, § 371 Date Mar. 6, 1987, § 102(e) Date Mar. 6, 1987, PCT Pub. No. WO87/00519, PCT Pub. Date Jan. 29, 1987

PCT Filed Jun. 10, 1986, Ser. No. 24,300

Int. Cl.[4] C07C *47/796, 43/243*

U.S. Cl. 568—332 **4 Claims**

1. An olefin of the formula



(II)

where R is selected from the group consisting of 3-fluoro-4-phenylphenyl (A), 4-(2-methylpropyl)phenyl (B), 6-methoxy-2-naphthyl (C) and 3-benzoylphenyl (D) and carbonyl protected forms of (IID).

4,885,405

PROCESS FOR THE PRODUCTION OF PURE DIMETHYLETHER AND A CATALYST USED IN THE PROCESS

Horst Dornhagen; Hartmut Hammer; Bernd Haas, and Ewald Meisenburg, all of Union Kraftstoff, Ludwigshafener Strasse, D-5047 Wesseling, Fed. Rep. of Germany

Filed Dec. 10, 1987, Ser. No. 131,112
Int. Cl.[4] C07C 41/09
U.S. Cl. 568—698 7 Claims

1. Process for the production of dimethylether by catalytic dehydration of methanol at a temperature of 140°–500° C. and a pressure of 0.2 to 50 bar, characterized in that the dehydration is carried out in the presence of a γ-Al_2O_3 catalyst, which contains 0.0001 to less than 1 weight-% of SiO_2.

4,885,406

HYDROCARBON-SOLUBLE COMPLEXES OF MAGNESIUM ALKOXIDES WITH MAGNESIUM ARYL OXIDES

Andrzej M. Piotrowski, Thornwood, N.Y., and Dennis B. Malpass, LaPorte, Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Jul. 5, 1988, Ser. No. 215,121
Int. Cl.[4] C07C 39/00
U.S. Cl. 568—716 4 Claims

1. A hydrocarbon-soluble complex of a magnesium alkoxide and a magnesium aryl oxide of the formula $Mg(OR)_x(OR')_y$, where R is alkyl and R' is derived from a hindered phenol, and x and y can range from about 0.1 to about 1.9 with their sum being substantially equal to 2.

4,885,407

METHOD FOR RECOVERING A DIHYDRIC PHENOL FROM A SCRAP POLYESTER

Daniel W. Fox, Pittsfield, and Edward N. Peters, Lenox, both of Mass., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 11, 1988, Ser. No. 217,026
Int. Cl.[4] C07C 39/16, 37/68
U.S. Cl. 568—724 12 Claims

1. A method for recovering a dihydric phenol from scrap polyester which comprises

a. contacting an aromatic polyester selected from the group consisting of polycarbonate, copolyestercarbonate and a polyarylate with

(1) an aqueous ammoniacal solution of sufficient strength to sever the ester bonds of the aromatic polyester, and

(2) an alkylchloride in which the polyester is at least partly soluble,

b. forming two mobile liquid phases, the top phase being aqueous and the bottom phase being the alkyl chloride and containing ammonium dihydric phenolate;

c. separating the top phase from the bottom phase;

d. recovering from the bottom phase the dihydric phenol.

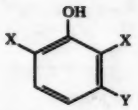
4,885,408

CHLORINATION OF ORTHO-SUBSTITUTED PHENOLS

Serge Ratton, Villefontaine, and Jean-Roger Desmurs, Saint-Symphorien d'Ozon, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 2, 1987, Ser. No. 69,233
Claims priority, application France, Jul. 2, 1986, 86 09813
Int. Cl.[4] C07C 39/32
U.S. Cl. 568—779 21 Claims

1. A process for the chlorination of orthosubstituted phenols, comprising reacting gaseous chlorine with a phenolic compound having the general formula (I):



(I)

wherein each X, which may be identical or different, is a chlorine or bromine atom, a methyl or ethyl group, a methoxy or ethoxy group, or an acetoxy group, and Y is a hydrogen atom, a methyl or ethyl group, or a methoxy or ethoxy group, in the presence of a catalytically effective amount of a strong acid or Lewis acid.

4,885,409

PROCESS FOR THE HYDROGENATION OF BIS-PHENOLS

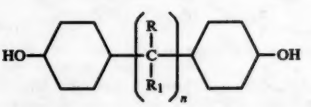
Andrea Gardano, Trino Vercellese; Francesco Casagrande, Novara; Marco Foà, Novara; Guido Petrini, Novara Galliate; Riccardo Barisone, Novara, and Lawrence Chapoy, Lesa, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 4, 1988, Ser. No. 190,049
Claims priority, application Italy, May 5, 1987, 20368 A/87
Int. Cl.[4] C07C 35/21
U.S. Cl. 568—834 10 Claims

1. A process for the hydrogenation of bisphenol having the formula

(I)

wherein R and R_1, equal to or different from each other, are hydrogen or C_1–C_{10} alkyl radicals, and n is 0 or 1, to a product having the formula:



(I')

wherein R, R_1 and n have the above meanings, with a content of trans-trans isomer in the product higher than 55% by weight and a reaction selectivity higher than 99% by weight, said process comprising reacting the compound (I), in bulk or in a solvent, with hydrogen in the presence of a catalytic system consisting essentially of palladium supported on an activated carbon, at a reaction temperature between activated carbon, at a reaction temperature between 80° and 160° C.

4,885,410

HYDROGENATION CATALYST

Waldo De Thomas, Parsippany, N.J., assignor to GAF Corporation, Wayne, N.J.

Division of Ser. No. 125,955, Nov. 27, 1987, Pat. No. 4,795,733.
This application Aug. 17, 1988, Ser. No. 232,975
Int. Cl.[4] C07C 5/02, 29/14
U.S. Cl. 568—861 7 Claims

1. The process of hydrogenating an organic compound having from 3 to 8 carbon atoms, selected from the group of compounds containing carbon to carbon unsaturation and a compound containing a carbonyl group, with hydrogen in the presence of a supported hydrogenation catalyst consisting essentially of

(a) between about 10 and about 90 wt. % of metallic nickel;

(b) between about 0.05 and about 5 wt. % of palladium; and
(c) between about 0.03 and about 10 wt. % of metallic rhenium to achieve substantially complete conversion of said organic compound.

4,885,411

HYDROGENATION PROCESS FOR CONVERTING LACTONES TO DIOLS

Waldo De Thomas, Parsippany, and Paul D. Taylor, West Milford, both of N.J., assignors to GAF Corporation, Wayne, N.J.

Division of Ser. No. 126,065, Nov. 27, 1987, Pat. No. 4,797,382. This application Aug. 19, 1988, Ser. No. 234,354
Int. Cl.[4] C07C *29/136*
U.S. Cl. 568—864 **15 Claims**

1. The vapor phase process of contacting a lactone having the formula:

wherein n is an integer having a value of from 3 to 8 and R in each instance is hydrogen or lower alkyl, with hydrogen in a mole ratio of hydrogen to lacetone of from about 50:1 to about 300:1 in the presence of an effective catalytic amount of a supported hydrogenation catalyst consisting essentially of:
(a) between about 8 and about 40 wt. % of metallic copper;
(b) between about 0.05 and about 5 wt. % of palladium or a mixture of palladium with another metal having an atomic weight greater than 100 and selected from group VIIB and VIII of the Periodic Table and
(c) between about 1.5 and about 10 wt. % of an alkali metal or an alkaline earth metal and reacting said lactone with hydrogen under alkaline conditions at a temperature above the dew point of said lactone, under a hydrogen pressure of from about 100 to about 1500 pounds to convert said lactone to the corresponding diol.

4,885,412

ALDEHYDE PRODUCTION FROM ALKYLAROMATICS USING MOLTEN NITRATE SALT CATALYST

B. Timothy Pennington, Sulphur, La., and Lawrence E. Katz, Orange, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Oct. 11, 1988, Ser. No. 255,238
Int. Cl.[4] C07C *27/12, 45/32*
U.S. Cl. 568—469.9 **10 Claims**

1. A process for producing an aldehyde or mixture of aldehydes by a reaction which comprises reacting an alkylaromatic compound selected from the group consisting of toluene, chlorotoluene, methoxytoluene, ethoxytoluene, ethylbenzene, xylenes, cumene, mesitylene and styrene, or mixture thereof, with an oxygen-containing gas, said alkylaromatic compound and said oxygen-containing gas being gaseous reactants, by contacting said gaseous reactants with a bath, stream, spray or mist of at least one alkali metal or alkaline earth metal molten nitrate salt catalyst, said catalyst being present in an amount sufficient to absorb any heat generated during said reaction while maintaining an essentially constant reaction temperature, said reaction being conducted at a reaction temperature of between about 135° C. and about 600° C. and a reaction pressure of between about 1 and about 50 atmospheres to produce the aldehyde or mixture of aldehydes.

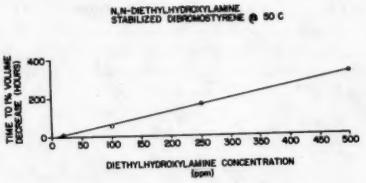
4,885,413

PROCESS AND COMPOSITION FOR STABILIZATION OF AR-BROMINATED STYRENIC MONMER AGAINST PREMATURE STABILIZATION

Stephen M. Campbell, New England, W. Va., and John C. Wozny, Coolville, Ohio, assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation of Ser. No. 52,525, May 20, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,422
Int. Cl.[4] C07C *17/42, 25/02*
U.S. Cl. 570—104 **5 Claims**

1. A process for retarding rapid polymerization of ar-brominated styrene monomer and maintaining the ar-brominated styrene monomer at a level of 99% of its original volume for a period of 300 hours at temperatures at or below 50° C., said process comprising admixing a polymerization retarding amount of N,N-dialkylhydroxylamine with ar-brominated styrene monomer, said retarding amount being sufficient to produce a stable monomer which maintains 99% of its original volume for a period of 300 hours at temperatures at or below 50° C.



5. Ar-brominated styrene monomer stabilized against rapid polymerization, comprising a polymerization retarding amount of N,N-dialkylhydroxylamine, said retarding amount being sufficient to produce a stable monomer which maintains 99% of its original volume for a period of 300 hours at temperatures at or below 50° C.

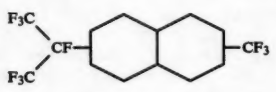
4,885,414

PERFLUORINATED PROPYL DERIVATIVE COMPOUNDS

Frank K. Schweighardt, 509 Bastian La., Allentown, Pa. 18105; Webb I. Bailey, 12 Woodsbluff Run, Fogelsville, Pa. 18051; John T. Lileck, Box 245B, Tamaqua, Pa. 18252; John K. Graybill, 335 N. Walnut St., Macungie, Pa. 18062, and Eugene G. Lutz, Box 15A, RD#3, Drums, Pa. 18222

Division of Ser. No. 89,293, Aug. 25, 1987. This application Feb. 21, 1989, Ser. No. 313,130
Int. Cl.[4] C07C *19/08, 17/02*
U.S. Cl. 570—130 **3 Claims**

1. The perfluorinated compounds of the formula:



wherein the carbon rings are fully fluorinated.

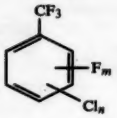
4,885,415

PROCESS FOR THE PREPARATION OF BENZOTRIFLUORIDES WHICH ARE SUBSTITUTED BY FLUORINE AND OPTIONALLY IN ADDITION BY CHLORINE

Albrecht Marhold, Leverkusen, and Rudolf Braden, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 220,038
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1987, 3725659
Int. Cl.[4] C07C *21/24*
U.S. Cl. 570—144 **13 Claims**

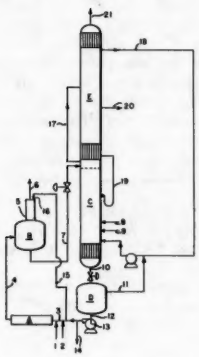
1. A process for the preparation of benzotrifluoride substituted by fluorine and optionally in addition by chlorine, comprising hydrogenating a benzotrifluoride substituted by fluorine and chlorine in the presence of a hydrogenation catalyst and in the presence of a hydrogen chloride acceptor and in an inert diluent or solvent, wherein the benzotrifluoride is of the formula (I)



(I)

in which
m is an integer of 1 to 4 and
n is an integer from 1 to 5−m,
and recovering the benzotrifluoride product.

4,885,416
FLUORINATION PROCESS
Frederick W. Mader, Kennett Square, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.
Continuation of Ser. No. 789,288, Oct. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 507,084, Jun. 23, 1983, abandoned. This application Feb. 9, 1988, Ser. No. 154,421
Int. Cl.[4] C07C *17/20, 17/22, 19/02, 19/08*
U.S. Cl. 570—170 **28 Claims**



1. A continuous process for fluorinating haloalkanes comprising:
continuously fluorinating antimony pentachloride to an antimony (V) chlorofluoride by continuously supplying hydrogen fluoride and antimony (V) pentachloride containing no more than 10% trivalent antimony to a first reaction zone while continuously removing by-product hydrogen chloride gas from the antimony (V) chlorofluoride thus produced,
continuously feeding said antimony chlorofluoride to a separate reaction zone while continuously supplying a fluorinatable haloalkane containing at least one nonfluorine halogen atom to said separate reaction zone and reacting said antimony chlorofluoride with said haloalkane thereby replacing a portion of said nonfluorine halogen in said haloalkane with fluorine of said antimony chlorofluoride and recovering the fluorinated haloalkane or haloalkanes produced.

4,885,417
METHOD FOR THE DECOLORATION OF CHLORO-XYLENE COMPOSITIONS
Kenneth F. Kubiak, Cheektowaga, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.
Filed Sep. 19, 1988, Ser. No. 246,485
Int. Cl.[4] C07C *17/38*
U.S. Cl. 570—211 **6 Claims**

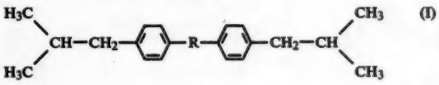
1. A process for removing discoloration from an off-color liquid ortho-chloro-para-xylene composition which comprises contacting the liquid ortho-chloro-para-xylene composition with particulate material selected from the group consisting of magnesium oxide, diatomaceous silica, or soda ash, separating the particulate material and recovering decolorized ortho-chloro-para-xylene.

4,885,418
PROCESS FOR REMOVING METAL HALIDES FROM LIQUID ORGANIC WATER-IMMISCIBLE SUBSTANCES
Sigurd Hartung, deceased, late of Cologne (by Erika Hartung, Volker Hartung, Dirk Hartung, heirs); by Birgit Hartung-Merse, heir, Pulheim-Sinnersdorf; Uwe Beck, Leverkusen; Ulrich Kappler, Langenfeld; Alfred Mitschker, Odenthal-Holz, and Andreas Gräfe, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Sep. 9, 1988, Ser. No. 242,402
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731995
Int. Cl.[4] C07C *17/38*
U.S. Cl. 570—211 **8 Claims**

1. A process for removing metal halides from a liquid organic water-immiscible hydrocarbon chlorination mixture, which comprises treating the liquid organic water-immiscible mixture which contains the metal halides with a water-containing anion-exchanger in the OH form.

4,885,419
1,2-DI(4-ISOBUTYLPHENYL)HYDROCARBON AND ITS PREPARATION AND USES AS INTERMEDIATE
Isoo Shimizu, Yokohama; Yasuo Matsumura, Yokohama, and Yoshihisa Inomata, Kawasaki, all of Japan, assignors to Nippon Petrochemicals Company, Ltd., Japan
Filed May 5, 1988, Ser. No. 190,506
Claims priority, application Japan, May 6, 1987, 62-110176; May 6, 1987, 62-110177
Int. Cl.[4] C07C *15/12, 15/18*
U.S. Cl. 585—25 **5 Claims**

1. 1,2-di(4-isobutylphenyl)hydrocarbon which is represented by the following formula (I):



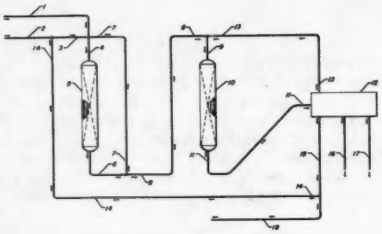
(I)

wherein the substituent R represents either
a substituent —CH_2—CH_2— or
a substituent —CH=CH—.

4,885,420
PROCESS FOR THE PRODUCTION OF AROMATIC HYDROCARBONS FROM OLEFINIC HYDROCARBONS
David C. Martindale, Roselle, Ill., assignor to UOP, Des Plaines, Ill.
Filed Oct. 31, 1988, Ser. No. 265,376
Int. Cl.[4] C07C *2/52, 12/02*
U.S. Cl. 585—322 **13 Claims**

1. A continuous multi-stage catalyst process for producing aromatic hydrocarbons from a feedstock comprising C_2–C_5 olefins by the steps of:
(a) passing the C_2–C_5 hydrocarbon feedstock comprising olefins along with hydrogen into a hydrogenation reaction zone containing a hydrogenation catalyst and operated at hydrogenation reaction conditions to produce a hydrogenation reaction zone product containing at least 50 mole percent fewer olefinic hydrocarbons than the C_2–C_5 hydrocarbon feedstock;
(b) passing the hydrogenation reaction zone product into a dehydrocyclodimerization reaction zone containing a

dehydrocyclodimerization catalyst and operated at dehydrocyclodimerization reaction conditions to produce a dehydrocyclodimerization reaction zone product comprising hydrogen, methane, ethane, ethylene, C_3–C_5 aliphatic hydrocarbons, C_6+aliphatic hydrocarbons, and aromatic hydrocarbons; and



(c) recovering the products of the dehydrocyclodimerization reaction zone.

4,885,421

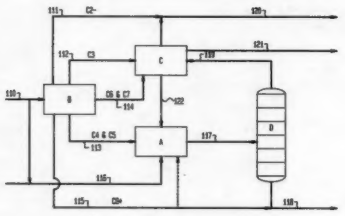
MULTISTAGE REACTOR SYSTEM FOR PRODUCTION OF FUELS

Mohsen N. Harandi, 12 Catbord Ct., Lawrenceville, N.J. 08648, and Hartley Owen, 5 Riverview Ter., Belle Mead, N.J. 08502

Continuation-in-part of Ser. No. 130,256, Dec. 8, 1987, Pat. No. 4,788,365. This application Nov. 16, 1988, Ser. No. 271,836

Int. Cl.[4] C07C *1/20, 2/00*

U.S. Cl. 585—403 **2 Claims**



1. An integrated reactor system for conversion of oxygenated hydrocarbon to high octane gasoline and distillate fuels, comprising:

(a) first reactor means for contacting oxygenated hydrocarbon feed with solid conversion catalyst in a conversion zone under oxygenate conversion conditions to produce a first effluent stream comprising a major portion of olefinic hydrocarbons;

(b) fractionation means for separating said first effluent stream to provide a first C_2^- olefinic stream, a second C_3 olefinic stream, a third C_4 and C_5 olefinic stream containing iso-olefins, a fourth C_6–C_7 olefinic stream and a fifth C_8+ olefinic stream;

(c) fluid handling means for passing said second C_3 olefinic stream and said fourth C_6–C_7 olefinic stream to an olefins oligomerization zone in a second reactor;

(d) second reactor means for converting said second and fourth streams under oligomerization conditions in contact with medium pore size shape selective zeolite catalyst, whereby C_5+ gasoline and distillate are produced;

(e) fractionation means for separating second reactor effluent to recover a distillate product stream, light hydrocarbon byproduct and a C_5+ gasoline stream;

(f) fluid handling means for passing at least a portion of said C_5+ gasoline from fractionation means (e) and said third C_4–C_5 olefinic hydrocarbon stream from (b) in conjunction with a methanol feedstream providing a stoichiometric excess of methanol to iso-olefins to an etherification zone in a third reactor;

(g) third reactor means for converting iso-olefins contained in said C_5+ gasoline and said third stream in contact with an acid etherification catalyst under etherification conditions to produce a high octane ether-rich gasoline mixture;

(h) fractionation means for recovering an overhead vapor stream comprising unreacted methanol and C_4 and C_5 hydrocarbons and a liquid bottom stream comprising ether-rich gasoline; and

(i) fluid handling means for passing the methanol containing vapor stream comprising unreacted methanol and C_4 and C_5 hydrocarbons to said second reactor oligomerization zone for conversion to gasoline and distillate.

4,885,422

CATALYTIC PROCESS FOR THE CONVERSION OF HYDROCARBONS

Li Wang, Huntington, Conn., assignor to UOP, Des Plaines, Ill.

Division of Ser. No. 99,175, Sep. 21, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 294,843

Int. Cl.[4] C07C *2/52, 12/46*

U.S. Cl. 585—419 **3 Claims**

1. A process for converting aliphatic hydrocarbons to aromatic hydrocarbons comprising contacting C_6–C_8 hydrocarbons in a reaction zone at dehydrocyclization conditions with a catalyst comprising a Group VIII metal component, a nonacidic L-zeolite, and an alumina-magnesia binder wherein the weight ratio of L-zeolite to alumina-magnesia is at least 1:1.

4,885,423

PROCESS FOR PREPARATION OF AROMATIC DIMERS

Mark Rule, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 198,360, May 25, 1988, abandoned. This application May 11, 1989, Ser. No. 350,667

Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—427 **7 Claims**

1. A process comprising preparation of iodine and an aromatic dimer compound corresponding to the structure

IxAr-ArIx

wherein x is 0, 1, 2, 3, 4, or 5, and Ar is a divalent aromatic radical containing 6 to 14 carbon atoms comprising contacting platinum and an aromatic iodide compound corresponding to the structure

Ar-Ix

where Ar is a aromatic radical and x is 1, 2, 3, 4, 5, or 6. the contacting being at a sufficient temperature and a sufficient pressure and in the absence of carbon monoxide and in the absence of an alkali metal compound and in the absence of an alkaline earth metal compound.

4,885,424

EFFLUENT SEPARATION METHOD FOR AROMATIC HYDROCARBON ALKYLATION PROCESS

Don L. Ferk, Evanston; Eugene Schmelzer, Skokie, and Edward C. Haun, Glendale Heights, all of Ill., assignors to UOP, Des Plaines, Ill.

Filed Feb. 5, 1988, Ser. No. 152,504

Int. Cl.[4] C07C *2/64*

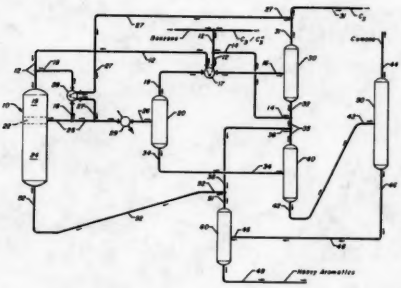
U.S. Cl. 585—450 **7 Claims**

1. A process for the production of alkylaromatic hydrocarbons which comprises contacting feed aromatic hydrocarbons and acyclic hydrocarbons in an alkylation reaction zone main-

tained at conditions to promote alkylation and recovering a reaction zone effluent comprising unconverted feed aromatic hydrocarbons and product aromatic hydrocarbons; wherein at least a portion of said unconverted feed aromatic hydrocarbons are recovered by:

(a) combining said reaction zone effluent with a working fluid comprising acyclic hydrocarbons in an amount such that the acyclic hydrocarbons added by said working fluid equal at least 2 wt. % of said reaction zone effluent to obtain a combined effluent stream, said acyclic hydrocarbons having a lower boiling point than said feed aromatic hydrocarbons;

(b) maintaining said combined effluent stream at a temperature sufficient to vaporize at least a portion of the hydrocarbons of said working fluid;



(c) passing said combined effluent stream to a flash separator and recovering overhead stream comprising the working fluid hydrocarbons and at least a portion of said unconverted feed aromatic hydrocarbon and a first bottoms stream comprising said product aromatic hydrocarbon;

(d) passing said overhead stream to a separation zone and recovering a recycle stream as a second bottoms stream, said recycle stream comprising said unconverted feed aromatic hydrocarbons and a working fluid stream as a second overhead stream, said working fluid stream comprising said acyclic hydrocarbons;

(e) returning at least a portion of said recycle stream to said alkylation reaction zone; and

(f) combining at least a portion of said working fluid stream with said reaction zone effluent to supply said working fluid.

4,885,425

ALKYLATION

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Division of Ser. No. 771,259, Aug. 30, 1985, Pat. No. 4,722,986, which is a continuation-in-part of Ser. No. 679,235, Dec. 7, 1984, Pat. No. 4,589,925, Ser. No. 675,774, Nov. 28, 1984, Pat. No. 4,673,552, Ser. No. 673,358, Nov. 20, 1984, Pat. No. 4,664,717, Ser. No. 673,508, Nov. 20, 1984, Ser. No. 453,496, Dec. 27, 1982, Ser. No. 444,667, Nov. 26, 1982, abandoned, Ser. No. 331,001, Dec. 15, 1981, Pat. No. 4,402,852, Ser. No. 330,904, Dec. 15, 1981, Pat. No. 4,404,116, Ser. No. 318,629, Nov. 5, 1981, Pat. No. 4,445,925, Ser. No. 318,368, Nov. 5, 1981, Pat. No. 4,447,253, and Ser. No. 318,343, Nov. 5, 1981, Pat. No. 4,397,675, said Ser. No. 453,496, is a continuation-in-part of Ser. No. 442,296, Nov. 17, 1982, abandoned. This application Jan. 29, 1988, Ser. No. 149,734

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.[4] C07C 2/66

U.S. Cl. 585—458 **33 Claims**

1. The method for carrying out an acid-catalyzed reaction of an organic compound, which method comprises the step of conducting said reaction in the presence of a catalyst composition comprising the mono-adduct of sulfuric acid and a chalcogen-containing compound having the empirical formula

wherein X is a chalcogen, each of R_1 and R_2 is selected from the group consisting of hydrogen, NR_3R_4 and NR_5, at least one of R_1 and R_2 is other than hydrogen, each or R_3 and R_4 is selected from the group consisting of hydrogen and monovalent organic radicals, and R_5 is a divalent organic radical.

4,885,426

TRANSALKYLATION OF POLYAROMATICS

Yung F. Chu, Plainsboro; David O. Marler, Deptford, and John P. McWilliams, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 92,503, Sep. 2, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 327,378

Int. Cl.[4] C07C 5/22

U.S. Cl. 585—474 **13 Claims**

1. A process for transalkylating benzene to produce monoalkylaromatics and polyalkylaromatics and recovering monoalkylaromatics, which process exhibits a selectivity for polyalkylaromatic production, the improvement comprising decreasing said selectivity,

by contacting a feedstock consisting essentially of 40 to 80 wt % benzene, 15 to 50 wt. % dialkylbenzene, and 2 to 20 wt. % C_9 monoalkylaromatics and 0 to 5 wt. % C_9+aromatics,

with a catalyst comprising ZSM-5, wherein said ZSM-5 has a silica:alumina mole ratio of from about 20 to about 30 and an alpha value of at least about 140;

undertaking said contacting at a temperature of from about 400° F. to about 1000° F., a pressure of from about 0 to about 3000 psig, a hydrogen/hydrocarbon mole ratio of from 0 to about 4 and a weight hourly space velocity, based upon weight of active catalyst component, of from about 0.1 hr^{-1} to about 100 hr^{-1}; and

recovering ethylbenzene.

4,885,427

ISOMERIZATION OF UNEXTRACTED, ETHYLBENZENE-CONTAINING XYLENE STREAMS USING A CATALYST MIXTURE CONTAINING MOLYBDENUM ON SILICA AND SUPPORTED CRYSTALLINE BOROSILICATE MOLECULAR SIEVE

Mark G. Reichmann, Oak Park, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 29, 1988, Ser. No. 250,950

Int. Cl.[4] C07C 5/22

U.S. Cl. 585—480 **7 Claims**

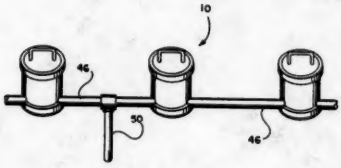
1. A vapor phase process comprising isomerizing in the presence of hydrogen an unextracted xylene stream containing a major amount of xylene and a minor amount of ethylbenzene to a mixture rich in paraxylene over a catalyst mixture containing a supported HAMS-1B crystalline, borosilicate molecular sieve incorporated into alumina component and a molybdenum on silica component, said molybdenum on silica component containing between about 1 and about 20 weight percent molybdenum calculated as the metal, said catalyst mixture containing between about 5 and about 95 percent by weight of said molybdenum on silica component based upon the total weight of said mixture, and said HAMS-1B crystalline, borosilicate molecular sieve incorporated in alumina component containing between about 40 and about 95 weight percent alumina.

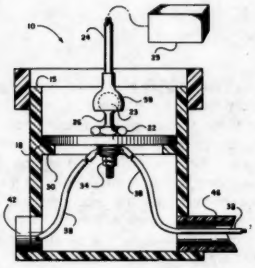
4,885,428

SYSTEM FOR ELECTRICAL GROUNDING

Edgar Roberts, Valdosta, Ga., assignor to A-1 Construction Company, Valdosta, Ga.

Filed Apr. 19, 1988, Ser. No. 183,585
Int. Cl.[4] H01R *4/66*
U.S. Cl. 174—6 16 Claims





8. An electrical grounding system, comprising:
an electrically insulative housing having a closed bottom end;
at least one opening in the housing sized to permit passage of a common ground wire into the housing;
a flange on the interior of the housing;
a support plate removably disposed on the flange;
a single ground electrode for grounding in the earth; and
a ground terminal rigidly connected to the support plate, the ground terminal being for connecting to at least one electrical device, the ground terminal being connected to a common ground wire which extends through the opening and into electrical communication with the single ground electrode, such that each electrical device, when connected in electrical communication with the ground terminal, shares a common voltage potential with each other electrical device.

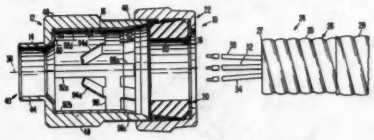
4,885,429

METAL CLAD CABLE CONNECTOR

William E. Schnittker, St. Louis, Mo., assignor to Hubbell Incorporated, Orange, Conn.

Filed Jan. 10, 1989, Ser. No. 295,526
Int. Cl.[4] H02G *3/06*
U.S. Cl. 174—65 SS 25 Claims

1. A connector for metal clad cable having a distal end and an outer surface, the combination comprising:
a tubular body having a longitudinal axis, a through passageway extending along said longitudinal axis, and first and second open ends,
said first and second open ends having external threads thereon,
said through passageway having an inwardly facing surface and an axially directed stop shoulder, said stop shoulder being adapted to engage the distal end of the cable;
a grounding ring received in said through passageway and engaging said inwardly facing surface and said stop shoulder,
said grounding ring including a substantially annular central portion, a plurality of straight tines extending axially from said central portion and engaging said inwardly facing surface and said stop shoulder, and a plurality of angled tines extending inwardly from said central portion and adapted to engage the outer surface of the cable;



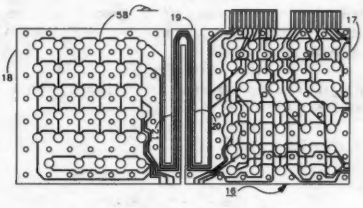
a resilient grommet received in said through passageway and having first and second ends and a central passageway, said grommet first end engaging said grounding ring and said central passageway adapted to receive the cable therein; and
a tubular closure having a first end with internal threads engaging said external threads on said tubular body second open end and a second end with an annular flange engaging said grommet second end, said tubular closure adapted to receive the cable therein.

4,885,430

FLEXIBLE PRINTED CIRCUIT ASSEMBLY WITH TORSIONLY ROTATED CONDUCTORS

Ralph W. Kinser, Jr.; David L. Shriver, and Judith A. Layman, all of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 868,401, May 29, 1986. This application Aug. 31, 1988, Ser. No. 239,105
Int. Cl.[4] H05K *1/00*
U.S. Cl. 174—254 7 Claims

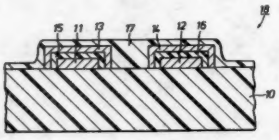


1. A flexible printed circuit assembly for interconnecting a first assembly and a second assembly, one of which is rotatable relative to the other, the flexible printed circuit assembly comprising:
a first portion of flexible substrate, bearing flexible conductors, for mounting to the first assembly;
a second portion of flexible substrate, bearing flexible conductors, for mounting to the second assembly;
an interconnecting portion of flexible substrate, bearing flexible conductors, having first and second parallel sections spaced a distance apart and joined to each other at one end by a transition section traversing the distance apart and each section joined to a respective end of the first and second portion at the other end, the first and second parallel sections being of sufficient length and narrowness and of a supple material to permit the essentially unresisted twisting thereof through at least ninety degrees along the lengths thereof.

4,885,431
PRINTED CIRCUIT BOARD

Shin Kawakami; Satoshi Haruyama; Hirotaka Okonogi; Katutomo Nikaido, and Norito Mukai, all of Saitama, Japan, assignors to Nippon CMK Corp., Saitama, Japan

Filed Mar. 29, 1988, Ser. No. 174,835
Claims priority, application Japan, Sep. 19, 1987, 62-235766
Int. Cl.[4] H05K 1/00
U.S. Cl. 174—68.5 6 Claims

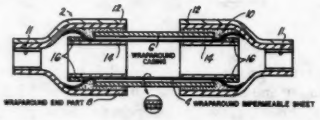


1. A printed circuit board comprising:
a base plate having opposed major surfaces;
electrically conductive elements formed on at least one major surface of said base plate;
an insulating layer formed directly on and covering all electrically exposed surfaces of each respective electrically conductive element;
a shield film formed over all exposed surfaces of each respective insulating layer to effectively shield the electrically conductive elements from external electric noise; and
another insulating layer formed on and covering all exposed surfaces of the shield films and the exposed surface of said one major surface of said base plate.

4,885,432
SPLICE CASE

William E. Amoyal, Maisons-Laffitte, France, and Joris R. I. Franckx, Bonheiden, Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 5, 1988, Ser. No. 178,033
Claims priority, application United Kingdom, Apr. 6, 1987, 8708136; Jun. 18, 1987, 8714279
Int. Cl.[4] H02G 15/113
U.S. Cl. 174—92 20 Claims

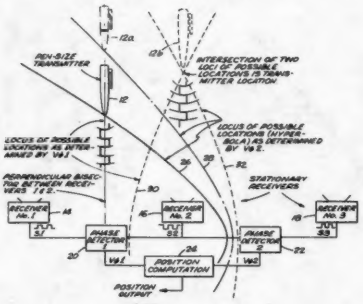


1. A wraparound assembly suitable for environmentally protecting a cable splice, which comprises:
(a) a flexible impermeable sheet that can be wrapped around the splice substantially totally to enclose the splice;
(b) a wraparound casing that can be positioned around the central portion of the wrapped splice;
(c) wraparound end parts that can be positioned to surround and be sealed to each end of the wraparound casing; and
(d) a sealing material associated with the impermeable sheet and positioned to seal the impermeable sheet to the wraparound casing and/or the wraparound end parts in such a way that the seal thus formed is not put into peel in response to a pressure that is higher inside than outside the splice.

4,885,433
POSITION DETERMINING APPARATUS

J. A. Schier, 7105 Owens St., Tujunga, Calif. 91042

Filed Jan. 3, 1989, Ser. No. 292,947
Int. Cl.[4] G08C 21/00
U.S. Cl. 178—19 10 Claims

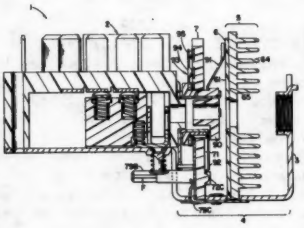

INTERSECTION OF TWO LOCI OF POSSIBLE LOCATIONS IS TRANSMITTER LOCATION
LOCUS OF POSSIBLE LOCATIONS AS DETERMINED BY Vθ1
LOCUS OF POSSIBLE LOCATIONS (HYPERBOLA) AS DETERMINED BY Vθ2
PERPENDICULAR BISECTING BETWEEN RECEIVERS 1 & 2
STATIONARY RECEIVERS
RECEIVER No. 1
RECEIVER No. 2
RECEIVER No. 3
PHASE DETECTOR 1
PHASE DETECTOR 2
POSITION COMPUTATION
POSITION OUTPUT

1. A position determining apparatus, comprising:
(a) transmitter means for transmitting modulated signals;
(b) at least three spaced apart signal receiving means for receiving said modulated signals transmitted by said transmitter means for converting said signals to first output signals and then for transmitting said first output signals;
(c) a first detector means for receiving and analyzing said first output signals from a selected two of said signal receiving means and then to generate and transmit a second output signal;
(d) a second detector means for receiving and analyzing said first output signals from a selected different two of said signal receiving means and to generate and then to transmit a third output signal;
(e) computation means for receiving said second and third output signals and for comparing said signals to determine the position of said transmitter means relative to said signal receiving means.

4,885,434
AUTOMOTIVE HEADLIGHT, PUSH-PULL, ROTARY SWITCH SYSTEM

Anthony Vultaggio, Warren, and David A. Coffin, Novi, both of Mich., assignors to United Technologies Automotive Inc., Dearborn, Mich.

Filed May 12, 1988, Ser. No. 193,017
Int. Cl.[4] H01H 9/00
U.S. Cl. 200—4 15 Claims



1. In a composite, automotive push-pull, rotary switch structure for a headlight switch and at least tow other electrical switch functions for a vehicle, which switch structure includes longitudinally in line a basic push-pull switching component for the vehicle's headlights, a rheostat having a connection to

a main, rotary shaft rotatable by the user to dim and brighten an electrical light, such as, for example, the panel light, and a front bracket area, the improvement comprising:

a flexible, rotatable detent arm;

a rotatable rheostat contactor arm;

a rotatable switching structure, said rotatable arms and said switching structure mounted for common rotary movement together in conjunction with the rotary shaft;

at least one panel having three, spaced, parallel, laterally extended, operative planar surfaces associated with it;

a rheostat planar surface including a rheostat having circularly disposed resistance means for varying the amount of resistance put into a circuit by the rheostat to brighten and dim the vehicle light in cooperation with said rotatable rheostat arm rotatably sweeping across it;

a detent planar structure including a series of raised protrusions, which serve as detent positions for the rotary portion of the overall switch in cooperation with said flexible, rotatable detent arm rotatably sweeping across it; and

a switch circuit planar surface having spaced conductive surfaces and contacts which control the other electrical functions; said rotatable arms, said rotatable switching structure and said panel all being located within the front bracket area of the composite switch structure.

4,885,435

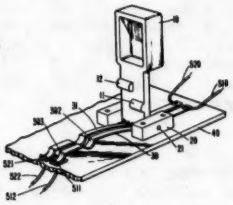
CANTILEVER SPRING SWITCH HAVING MULTIPLE FULCRUMS

Willard A. Dix, Noblesville, Ind., assignor to Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Dec. 23, 1988, Ser. No. 289,091

Int. Cl.[4] H01H *21/80*

U.S. Cl. 200—1 B **14 Claims**



1. In combination:

a printed wiring board having a plurality of electronic components located thereon, the printed wiring board further including electrical paths interconnecting said electronic components, and holes for receiving said electrical components;

an electrically conductive spring member having one end thereof inserted into a hole in the printed wiring board where connection to a first electrical path is made, the spring member including a contact at an other end thereof that normally makes electrical connection to a second electrical path on the printed wiring board, the spring member further including a downward protrusion between the ends of the spring and positioned between the spring and the printed wiring board but not normally touching the printed wiring board; and

an actuator, operative for applying a downward force to the spring member between its downward protrusion and said one end thereof, the actuator functioning to drive the protrusion into contact with the printed wiring board thereby causing said other end of the spring member to break its electrical connection with the second electrical path.

4,885,436

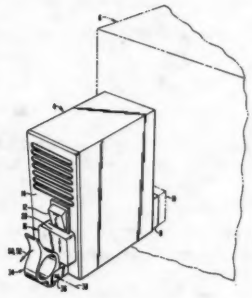
ELECTRONIC MODULE INTERLOCK AND EXTRACTION MECHANISM

Hoa Pham, San Jose, and Robert C. Max, Daly City, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Aug. 29, 1988, Ser. No. 238,006

Int. Cl.[4] H01H *3/20*

U.S. Cl. 200—50 A **20 Claims**



1. A removable electronic module interlock and extraction mechanism, the module of the type for use with an electrical unit, the module including an enclosure having a first panel, the module and electrical unit having mating connectors, the mechanism comprising:

a switch mounted to the first panel movable between first and second positions;

a switch guard movably mounted to the first panel for movement between third and fourth positions, the switch guard being movable to the fourth position only when the switch is in the first position, the switch guard and switch being configured to prevent the switch from moving from the first position to the second position when the switch guard is in the fourth position;

an actuator movably mounted to the enclosure adjacent the switch guard for movement between fifth and sixth positions, the actuator configured to move the switch guard from the third to the fourth positions when the actuator is moved from the fifth to the sixth positions;

the actuator including a grasping element for urging the module into and out of the electrical unit; and

means for biasing the switch plate from the third to the fourth positions and against the actuator.

4,885,437

ROTATING CAM LIMIT SWITCH

David M. Tenniswood, Birmingham, Mich.; Kevin I. Pea, Mayville, and Steven M. Loeck, Beaver Dam, both of Wis., assignors to Gleason Reel Corp., Mayville, Wis.

Filed Mar. 11, 1988, Ser. No. 166,654

Int. Cl.[4] H01H *19/62, 3/42;* **F16H** *53/00*

U.S. Cl. 200—31 R **34 Claims**

1. A rotating cam limit switch having fixed and rotating elements comprising:

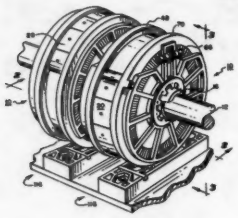
a rotating hub for mounting rotating elements of said switch to a rotating member;

a rotating retractable cam having an exposable cam surface;

rotating adjustable position means mounted to said hub for angularly adjusting the cam position, said position means being partially rotatable with respect to said hub;

rotating adjustable dwell means interfitted with said position means and said cam for varying the exposed length of the cam surface; and

fixed switch means actuated by the cam surfaces for assuming a first state as the cam surface is contiguous to said



switch means and returning to a second state when the cam surface is not contiguous to said switch means.

4,885,438

CONNECTOR SOCKET WITH A SWITCH

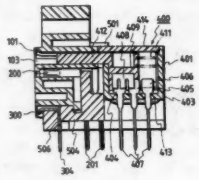
Kyousuke Tajima, Gunma, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Aug. 12, 1988, Ser. No. 231,814

Claims priority, application Japan, Aug. 17, 1987, 62-125380[U]

Int. Cl.[4] H01R *33/96*

U.S. Cl. 200—51.09 **10 Claims**



1. A connector socket with a switch, comprising:

(a) a socket body made of an insulating material and having an annular groove extending thereinto from a front end face thereof, a plurality of contact receiving holes made in a columnar portion encircled by the annular groove and extending from the front end face of the socket body therethrough in a direction in which a plug is to be inserted, a main positioning groove cut in the socket body across the annular groove and extending from the front end face of the socket body thereinto in the direction the plug is to be inserted, and an opening made in a face other than the front end face of the socket body and communicating with the main positioning groove;

(b) female contacts received in the contact receiving holes of the socket body;

(c) a resilient tubular metal cover formed by rolling up sheet metal having two opposed sides which are spaced apart from each other, said tubular metal cover being inserted into said annular groove of the socket body;

(d) a slide switch section including a plurality of fixed contact pieces arranged in at least one line, a movable contact piece for sliding contact with the fixed contact pieces, a holder holding the movable contact piece, a spring for biasing the holder in one direction, a switch box housing said fixed contact pieces, said movable contact piece, said holder and said spring, and an actuator formed integrally with the holder and extending out of the switch box through a hole in said switch box and into the main positioning groove through the opening of the socket body so that the actuator is driven by a plug which is inserted into the socket body; and

(e) means for fixedly coupling the slide switch section and the socket body together.

4,885,439

GAS DAMPED DECELERATION SWITCH

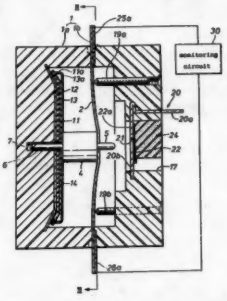
Kazumi Otsubo, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1988, Ser. No. 239,803

Claims priority, application Japan, Sep. 4, 1987, 62-135274[U]

Int. Cl.[4] H01H *35/14*

U.S. Cl. 200—61.45 R **24 Claims**



1. A deceleration switch for detecting deceleration of a certain magnitude, comprising:

contact means including a spring member for activating the deceleration switch, said contact means being electrically connected to a pair of output terminals of said deceleration switch;

a mass supported by said spring member and adapted to move from a neutral position to an active position for actuating said contact means under its inertia force when deceleration of a certain magnitide is applied to said deceleration switch; and

means for monitoring the electric conductivity of a part of said spring member.

4,885,440

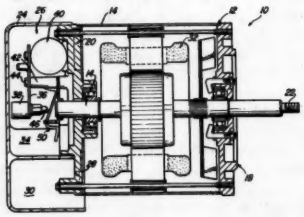
GOVERNOR AND MOTOR ASSEMBLY

Paul T. Kachuk, Ft. Wayne, Ind., assignor to Flint & Walling Industries, Inc., Kendallville, Ind.

Filed Dec. 21, 1987, Ser. No. 137,847

Int. Cl.[4] H01H *35/14*

U.S. Cl. 200—80 R **9 Claims**



1. A centrifugal governor assembly for an electric motor assembly having a motor housing with a stator assembly disposed therein and rotor shaft extending therethrough, one end of the rotor shaft extending through an end wall of the housing into an end bell of said motor assembly, the end hall housing a control switch having an actuator pin and adapted to shut off

the start winding of said motor assembly, said governor assembly comprising:

a carrier plate mounted to said one end of the rotor shaft, said carrier plate including a fulcrum member integrally formed therewith substantially perpendicular to said carrier plate;

a lever pivotably mounted to said fulcrum member of said carrier plate, said lever including an actuating arm extending radially inwardly from said fulcrum member to engage the actuator pin of the control switch and an integral extension arm disposed radially outward of said fulcrum member; and

a compression spring extending between said carrier plate and said actuating arm of said pivotable lever wherein said compression spring biases said actuating arm towards the actuator pin of the control switch, the compression force of said spring being overcome when said governor assembly attains a predetermined rotational speed.

4,885,441

CIRCUIT BREAKER

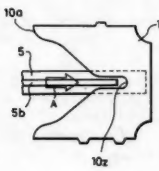
Fumiyuki Hisatsune, and Shinji Yamagata, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 201,415

Claims priority, application Japan, Sep. 16, 1986, 61-141915[U]; Sep. 16, 1986, 61-218594[U]; Sep. 16, 1986, 61-218595[U]

Int. Cl.[4] H01H *33/02*

U.S. Cl. 200—144 R **14 Claims**



1. A circuit breaker comprising:

a fixed arm;

a fixed contact provided on said fixed arm;

a movable arm adapted to be moved by actuation of a releasing device;

a movable contact provided on said movable arm, disposed to be connectable and disconnectable to said fixed contact by operation of said movable arm;

an arc extinguishing grid one end of which has a notch, formed to have a wide open end and a narrower closed end, for guiding therein an arc generated by a disconnection between said movable and fixed contacts; and

an arc guiding plate, one end of which is fixed to said fixed arm, having an arc running surface on which a protrusion is provided, wherein said protrusion has a height that is lower than a contact surface of said fixed contact relative to said arc guiding plate and terminates short of said closed end of said notch.

4,885,442

CONTACT ELEMENT

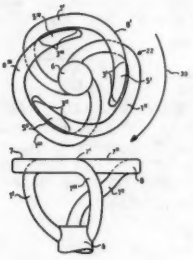
Karl Kriechbaum, Kassel, Fed. Rep. of Germany, assignor to AEG Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,240

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644453

Int. Cl.[4] H01H *33/66*

U.S. Cl. 200—144 B **12 Claims**



1. A contact element for a power switch which, in order to open or close the switch, cooperates with an opposite element, with a transitory rotating electric arc forming between the contact element and the opposite element when the switch is operated, said contact element being in the shape of an open loop and comprising:

an electrode having a contact surface made of an electrically conductive material and capable of facing the contact surface of a cooperating opposite element, said electrode having a proximal end at which a current may be introduced to said electrode and a free distal end which curves around and inwardly overlaps said proximal end so that there is a gap between said distal end and said proximal end, said gap being substantially smaller than the width of the electrode.

4,885,443

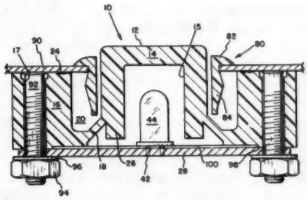
SEALED BACKLIT SWITCH ASSEMBLY

Steven B. Simcoe, Convoy, Ohio; Charles M. Orth, and John J. VanDaele, both of Fort Wayne, Ind., assignors to Tokheim Corporation, Fort Wayne, Ind.

Filed Nov. 29, 1988, Ser. No. 277,302

Int. Cl.[4] H01H *13/06*

U.S. Cl. 200—296 **21 Claims**



1. A sealed switch assembly for mounting on a panel, said switch assembly comprising:

a unitary resilient housing, said housing including a mounting portion and a movable hollow push button;

a grommet means adapted to be mounted in an aperture in the panel for receiving said push button therein and for guiding said push button for substantially linear movement;

insulating means for mounting electrical components thereon, said insulating means including mounting means for securing said insulating means in a predetermined aligned position with said grommet and for clamping, said resilient housing between said panel and said insulating means whereby said resilient housing is sealed against said panel;

switch means mounted on said insulating means and adapted to be actuated by said push button upon operation thereof; and

light source means mounted on said insulation means and disposed inside said hollow push button for illuminating said hollow push button.

4,885,444

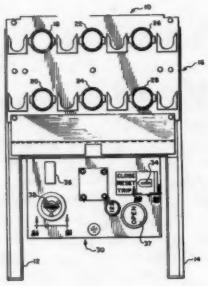
SWITCHGEAR OPERATING MECHANISM

Lawrence W. Lazar, West Allis, and Ronald A. Wainio, So. Milwaukee, both of, assignors to Cooper Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 894,643, Aug. 8, 1986, abandoned. This application Apr. 26, 1988, Ser. No. 186,456

Int. Cl.[4] H01H *3/00*

U.S. Cl. 200—401 21 Claims



1. In a switchgear having contact means for causing movement of at least one first contact relative to at least one second contact so as to engage and disengage said contacts to open and close an electrical circuit therebetween, an operating mechanism, comprising:

first resilient yieldable means for storing energy to engage said first and second contacts through said contact means;

second resilient yieldable means for storing energy to disengage said first and second contacts through said contact means;

a rotatable member, coupled to one end of said first resilient yieldable means and to one end of said second resilient yieldable means, for stressing said first resilient yieldable means and said second resilient yieldable means to store energy therein said rotatable member being mounted for movement through 360 degrees of rotation in one direction;

charging means, operating in response to a plurality of reciprocating strokes from a hook stick, for rotating said rotatable member in said one direction through a first predetermined arc of rotation to a first rotated position and releasably holding said rotatable member in said first rotated position to stress said first resilient yieldable means and said second resilient yieldable means; and

operating handle means, operable by at least one stroke of a hook stick and having a first position and a second position, for releasing energy stored in the first resilient yieldable means to engage said first and said second contacts by releasing said rotatable member from said first rotated position for continued rotation in said one direction through a second predetermined arc of rotation to a second rotated position when said handle means is moved by said hook stick to said first position, and for releasing energy stored in said second resilient yieldable means to disengage said first and said second contacts when said handle means is moved by a hook stick to said second position.

4,885,445

HIGH-FREQUENCY TRANSFORMER FOR MICROWAVE OVEN

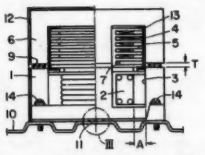
Hisaya Taniguchi, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 8, 1988, Ser. No. 281,524

Claims priority, application Japan, Dec. 9, 1987, 62-311242

Int. Cl.[4] H05B *6/64*

U.S. Cl. 219—10.55 B 2 Claims



1. A high-frequency transformer in a microwave oven, comprising:

an E-shaped first core forming the low-voltage side of the transformer, the core being made of a ferrite;

a primary winding wound around said first core over a coil winding bobbin;

an E-shaped second core forming the high-voltage side of the transformer, the second core also made of a ferrite, the second core disposed in opposition to said first core with a gap of a predetermined distance maintained therebetween;

an insulating material inserted in said gap for electrically insulating said second core from said first core;

a secondary winding wound around said second core over a coil bobbin; and

a grounding plate electrically connecting said first core to a bottom plate of said microwave oven, wherein the creepage distance formed between said primary winding and adjacent surface of said first core is greater than the width of the gap formed between said first and second cores.

4,885,446

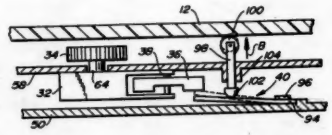
LOAD-RESPONSIVE MICROWAVE OVEN TURNTABLE

Yiu C. Liu, 973 Shulman Ave., Santa Clara, Calif. 95050

Continuation-in-part of Ser. No. 169,747, Mar. 16, 1988, Pat. No. 4,808,781. This application Nov. 30, 1988, Ser. No. 277,996

Int. Cl.[4] H05B *6/78*

U.S. Cl. 219—10.55 F 11 Claims



1. A portable microwave oven turntable comprising,

a base assembly having a planar bottom and upwardly extending sides to form a base interior,

drive gear means coupled to the base assembly for rotation about a vertical axis,

drive means for rotating the drive gear means about the vertical axis,

a table top in rotation transfer engagement with the drive gear means, the table top being adapted to support a load,

regulating means for controlling the rotational speed of the table top, the regulating means including a gear train and a governor, the gear train having an input end in engagement with the drive gear means and having an output end coupled to the governor, the governor employing cyclical motion to limit rotational speed at the input end, and

load-responsive means disposed within the base interior and operatively coupled to the table top for selectively preventing the cyclical motion of the governor so as to inhibit rotation of said table top, the load-responsive means being associated with a first force which urges the load-responsive means into a locking relation with the governor to prevent the cyclical motion, the first force being overcome by gravitational force when the table top supports a load, thereby releasing the load-responsive means from the locking relation to permit the cyclical motion.

4,885,447

SYSTEM FOR THE INDUCTION HEATING OF THE ELECTRIC PLATES OF A COOKER

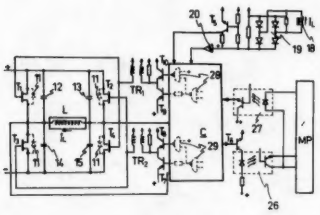
Juan Sánchez González, Zaragoza, Spain, assignor to Balay, S.A., Zaragoza, Spain

Filed Jan. 21, 1986, Ser. No. 821,061

Claims priority, application Spain, Jan. 23, 1985, 539790; Jan. 16, 1986, 550970

Int. Cl.[4] H05B *6/08*

U.S. Cl. 219—10.77 **15 Claims**



1. System for induction heating from an electric plate of a cooker, comprising:

a DC power supply;

an H-shaped inverter bridge having two diagonal legs connected across the power supply for electric current conduction through the bridge and a disc coil for the electric plate in the center between the legs, each leg having a pair of MOS transistors respectively at opposite ends of the coil for the electric current conduction in opposite directions through the coil, whereby to heat inductively a ferromagnetic load associated therewith;

a bistable circuit means activating alternate conduction of the pair of MOS transistors of each leg for pulses of the electric current conduction through the coil at a frequency higher than 20 kHz;

selector circuit means for varying the width of the pulses of the current through the coil, whereby to select the power of the inductive heating;

intensity limiting circuit means responsive to the intensity of the current of the pulses above a threshold for stopping the alternate conduction of the pair of transistors of each leg, whereby to protect the transistors; and

inductive recovery means for recovery of inductive energy produced by the coil with each pulse of the current.

4,885,448

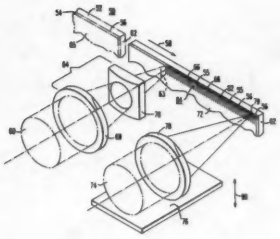
PROCESS FOR DEFINING AN ARRAY OF PIXELS IN A THIN FILM ELECTROLUMINESCENT EDGE EMITTER STRUCTURE

William H. Kasner, Penn Hills; Zoltan K. Kun, Churchill Borough; David Leksell, Oakmont, and Vincent A. Toth, Penn Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 6, 1988, Ser. No. 254,282

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.69 **20 Claims**



1. A method for defining an array of pixels in a thin film electroluminescent edge emitter structure comprising the steps of:

providing a thin film electroluminescent edge emitter structure having a pair of electrically conductive outer layers with a plurality of inner layers interposed therebetween, one of said inner layers formed from a phosphor material;

moving said structure and a first high energy source relative to each other as said first high energy source is operated to project, in serial fashion, a plurality of first high energy pulses, said plurality of first high energy pulses striking one of said outer layers at a plurality of spaced apart locations in succession;

ablating said one outer layer and a predetermined number of inner layers of said structure at said plurality of locations with said plurality of first high energy pulses to form, in succession, a plurality of spaced apart channels in said structure, the portions of said structure remaining between each pair of adjacent channels defining a plurality of pixels each having a pair of lateral edge surfaces and an end portion having an edge surface terminating at an edge surface of said structure;

moving said structure with said plurality of pixels formed therein and a second high energy source relative to each other as said second high energy source is operated to project a second high energy beam, said second high energy beam striking each said pixel end portion at an area inward of each said pixel edge surface and ablating said one outer layer and said predetermined number of inner layers at said end portion; and

controlling the movement of said structure and at least said second high energy beam relative to each other to correspondingly control the amount of material ablated from said one outer layer and said predetermined number of inner layers at said area inward of each said pixel edge surface to remove said pixel edge surface and form a new pixel edge surface shaped to a preselected contour.

4,885,449

ELECTRIC DISCHARGE MACHINE

Toshio Suzuki, and Takuji Magara, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

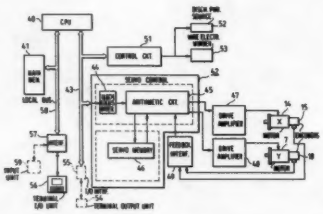
PCT No. PCT/JP87/00815, § 371 Date Aug. 5, 1988, § 102(e) Date Aug. 5, 1988, PCT Pub. No. WO88/03074, PCT Pub. Date May 5, 1988

PCT Filed Oct. 23, 1987, Ser. No. 224,852

Claims priority, application Japan, Oct. 24, 1986, 61-252928; Oct. 24, 1986, 61-252929; Oct. 24, 1986, 61-252931; Oct. 24, 1986, 61-252932; Oct. 24, 1986, 61-252933; Oct. 24, 1986, 61-252934; Oct. 24, 1986, 61-252935; Oct. 24, 1986, 61-252936; Oct. 24, 1986, 61-252939; Oct. 24, 1986, 61-252941

Int. Cl.[4] B23H *1/00, 7/06, 7/32*

U.S. Cl. 219—69.11 **8 Claims**



1. An electric discharge machine in which electric discharge is caused to take place between an electrode and a workpiece which are confronted through a machining solution with each other with a small gap therebetween, to machine said workpiece, and amounts of movements of drive shafts adapted to move said electrode and said workpiece relative to each other are corrected according to correcting data which have been stored in advance, which comprises:

memory means for storing correcting data for said drive shafts in advance which have been obtained under for a plurality of different values for a plurality of different machining conditions;

selecting means for selecting desired ones of said correcting data stored in said memory means in accordance with present machining conditions; and

control means for correcting, according to said correcting data selected by said selecting means, amounts of movement which are to be specified for said drive shafts during machining of said workpiece.

4,885,450

MACHINE FOR RESISTANCE BUTT WELDING OF PIPES

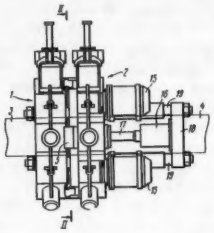
Boris E. Paton, ulitsa Chkalova, 41A, kv.26.; Vladimir K. Lebedev, ulitsa Engelsa, 25, kv.12.; Sergei I. Kuchuk-Yatsenko, prospekt 40-letia Oktyabrya, 21, kv.93.; Vasily A. Sakharnov, ulitsa Solomenskava, 41, kv.93.; Alexandr K. Kharchenko, ulitsa Demeevskaya, 37, kv. 165., and Mikhail R. Unigovsky, ulitsa Pushkinskaya, 21, kv.33, all of, Kiev, U.S.S.R.

Filed Dec. 16, 1988, Ser. No. 286,345

Int. Cl.[4] B23K *11/02*

U.S. Cl. 219—101 **3 Claims**

1. In a machine for resistance butt welding of pipes, comprising two semihousings adapted to be mounted externally onto the pipes to be welded to the opposite sides of a joint, a flash and upset drive operatively connected with said semihousings, a clamping device accommodated in each one of said semihousings, including a plurality of radially arranged hydraulic cylinders having each a piston rod rigidly connected with the respective one of said semihousings, and a housing; shoes mounted on the respective housings of said hydraulic cylinders, and a control system of said hydraulic cylinders, including a plurality of control valve means with follow-up spool valves structurally associated with said piston rods of the respective ones of said hydraulic cylinders, and a common



actuator for displacing said follow-up spool valves of said respective control valve means.

4,885,451

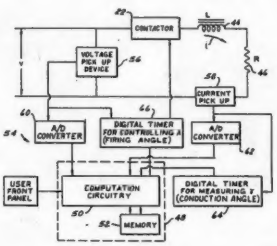
AUTOMATIC STEPPER FOR RESISTANCE WELDING

John F. Farrow, Plymouth, and David W. Schulz, South Lyon, both of Mich., assignors to Medar, Inc., Farmington Hills, Mich.

Filed May 9, 1988, Ser. No. 192,001

Int. Cl.[4] B23K *11/24*

U.S. Cl. 219—110 **17 Claims**



1. For use in a resistance welding process in which an alternating electrical current is delivered to a metal workpiece through a circuit including electrodes to produce a weld caused by localized melting of the workpiece, wherein the application of an excessive amount of said current results in expulsion of molten metal from said weld thereby diminishing the quality of said weld, a method of controlling the magnitude of current delivered to said workpiece through said electrodes, comprising the steps of:

(A) determining the time interval t_1 between the application of voltage to said electrodes and the following zero crossover of said voltage;

(B) determining the time interval t_2 between said zero crossover point of said voltage and the following zero point of the current resulting from said application of voltage;

(C) determining the value of the power factor of said circuit using the time intervals t_1, t_2 determined in steps (A) and (B), the expulsion of molten metal from said weld being a function of the value of the power factor determined in step (B); and

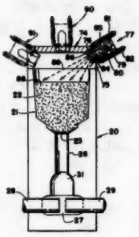
(D) changing the magnitude of said current based at least in part on the value of the power factor determined in step (C).

4,885,452

EXOTHERMIC WELDING AND METHOD

Michael D. Amos, Burton; David P. Kovarik, Eastlake, and George F. Kub, Jr., Northfield, all of Ohio, assignors to Erico International Corporation, Solon, Ohio

Filed Apr. 4, 1988, Ser. No. 177,076
Int. Cl.[4] B23K 9/06
U.S. Cl. 219—130.4 60 Claims



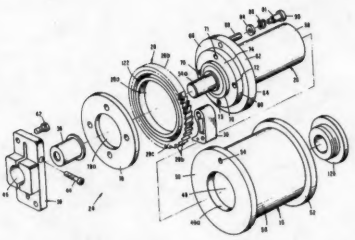
6. A method of converting exothermic material to molten metal comprising the steps of forming a spark gap in a matrix of such material, and then creating a high energy spark across such gap sufficient to initiate and sustain an exothermic reaction of such material wherein such matrix of exothermic material is contained in a small ignition cartridge and is expelled from such cartridge when ignited in turn to ignite a larger body of exothermic material.

4,885,453

BRAKE FOR WELDING MACHINE

Donald L. Martin, Santa Ana, Calif., assignor to M. K. Products, Irvine, Calif.

Filed Aug. 11, 1988, Ser. No. 231,179
Int. Cl.[4] B23K 9/00, 9/28, 9/10, 9/12
U.S. Cl. 219—136 12 Claims



1. In a welding machine which feeds filler material in the form of wire on a spool to a welding gun,

a spindle mounted to the machine to rotate, said spindle having a braking surface and outer end which fits into the spool when the spool is placed on the spindle,

a means for detachably coupling together the spindle and the spool when the spool is placed on the spindle so that said spindle and spool rotate together as a unit as wire is pulled from the spool, and

braking means for stopping rotation of the spindle and spool, including

a brake member having a braking surface which bears against the spindle braking surface and frictionally couples the braking member to the spindle so that the brake member and spindle rotate together as a unit as wire is pulled from the spool,

said spindle braking surface sliding over the brake member braking surface through a predetermined rotational distance when the rotation of the brake member is stopped abruptly, and

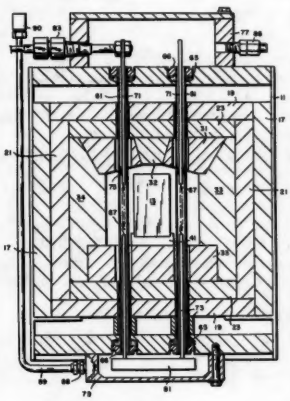
means for selectively and abruptly stopping the rotation of the brake member.

4,885,454

HIGH TEMPERATURE FURNACE FOR OXIDIZING ATMOSPHERES

Gerard H. Lavoie, Allenstown; Charles W. Miller, Jr., Gilmanton; John K. Currier, Belmont; Lionel F. Saunders, Northwood, and Daniel J. Leary, Pembroke, all of N.H., assignors to Centorr Associates, Inc., Suncook, N.H.

Filed Apr. 29, 1988, Ser. No. 188,499
Int. Cl.[4] H05B 3/64; F27D 11/02
U.S. Cl. 219—390 4 Claims



1. Apparatus for heating specimens to temperatures in the region of 2000 degrees C in a non-neutral atmosphere, said apparatus comprising:

a plurality of elongate, parallel sapphire tubes which are essentially coextensive in length and are distributed uniformly around a heating region located generally centrally along the lengths of said tubes;

within each of said tubes, an elongate resistive heater, each heater having at each and an elongate solid rod-like conductor with a filamentary tungsten heating element between said rod-like conductors, said heating elements forming a means for heating said region;

surrounding said region, an insulating shell, said tubes and the rod-like conductors extending through said shell, said shell including aperture means for permitting a specimen to be introduced into said region;

means forming a common plenum at each end of said tubes;

within said plenums, electrical connection means for applying electric current to said heaters;

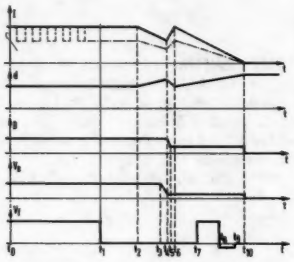
conduit means for introducing a controlled flow of a non-reactive gas into one of said plenums and for venting gas from the other of said plenums thereby to induce a protective gas flow through said tubes around said heating elements.

4,885,455

PROCESS FOR TERMINATING CLOSED THROUGH-HOLE PLASMA ARC WELDING

Jean-Pierre Schultz, Meulan, and Eric Verna, Cergy, both of France, assignors to l'Air Liquide, Societe Anonyme Pour l'Etude Et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Aug. 18, 1988, Ser. No. 233,550
Claims priority, application France, Aug. 18, 1987, 87 11669
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.46 **7 Claims**



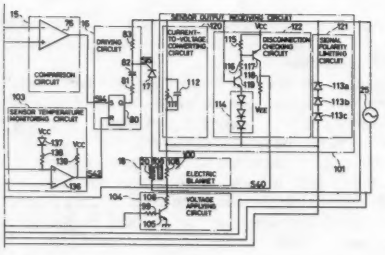
1. In a process for terminating through-hole plasma arc closed welding during which a plasmagenic gas passes through said hole, the improvement wherein the mean arc energy is continuously decreased until the hole is plugged, then said mean arc energy is increased while the plasmagenic flow rate is decreased before said mean arc energy is again continuously decreased to zero.

4,885,456

TEMPERATURE CONTROLLER

Teruya Tanaka, Kanagawa, and Katsuharu Matsuo, Aichi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 21, 1988, Ser. No. 260,704
Claims priority, application Japan, Oct. 21, 1987, 62-265946
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—497 **13 Claims**



1. A device for controlling a temperature of an electrical appliance , comprising:

a heating device for heating said electrical appliance;

a thyristor connected to an AC voltage source in series with the heating device;

a temperature setting circuit for predetermining a target temperature level at which the temperature of the electrical appliance is to be maintained and outputting a signal indicative of the target temperature level;

a temperature detecting circuit for detecting the temperature of the electrical appliance and outputting a signal indicative thereof;

a first pulse generator coupled to said AC voltage source for outputting a first pulse signal during the time period in which the phase of the output voltage of said AC voltage source is negative, wherein the trailing edge of said first pulse signal is prior to the zero point of the output voltage of said AC voltage source;

a comparator for outputting a signal indicative of a high temperature condition of said heating device by comparing the signal indicative of the target temperature level from said temperature setting circuit and the signal indicative of the temperature of the electrical appliance ; and

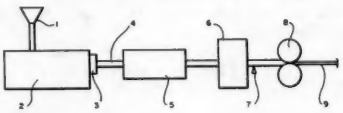
a trigger circuit for outputting a trigger pulse to said thyristor when both said first pulse signal and said high temperature indicative signal overlap, the pulse width of the trigger pulse extending beyond the zero point of said output voltage;

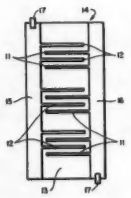
4,885,457

METHOD OF MAKING A CONDUCTIVE POLYMER SHEET

Andrew N. Au, Fremont, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 30, 1988, Ser. No. 252,229
Int. Cl.[4] H05B *3/34*
U.S. Cl. 219—548 **32 Claims**





1. A method of making a conductive polymer sheet, which method comprises

(1) melt-extruding a conductive polymer composition through a die to produce a hollow extrudate; and

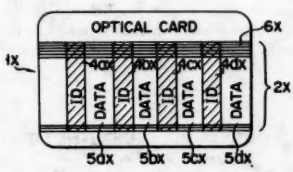
(2)slitting the extrudate axially to form a sheet, wherein the sheet has a length p measured in the machine direction of extrusion where the machine direction is the direction parallel to the extrusion direction, a width w measured in the transverse direction at right angles to the direction of extrusion, and a thickness t, and if the sheet is divided at right angles to the machine direction into equal transverse segments, each transverse segment having a width equal to the smaller of (a) 0.2p and (b) as close to 1 inch as division into equal segments will allow, the resistivity measured in the machine direction of each transverse segment is from 0.7 R_m to 1.3 R_m, where R_m is the resistivity in the machine direction of the sheet.

4,885,458

CARD-FORM RECORDING MEDIUM AND DATA RECORDING DEVICE THEREFOR

Toshio Horiguchi; Yuichiro Akatsuka, both of Hachioji, and Hisakatsu Tanaka, Chofu, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,090
Claims priority, application Japan, Feb. 4, 1987, 62-22576; Feb. 5, 1987, 62-23690
Int. Cl.[4] G06K 7/10, 7/14
U.S. Cl. 235—454 12 Claims



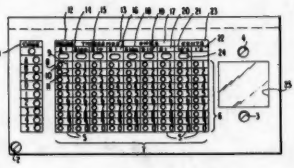
1. A card-form recording medium comprising:
a plurality of recording tracks provided on said card-form recording medium; and
means for indicating a data recording direction lengthwise along said plurality of recording tracks, including a direction indicating section provided on said card-form recording medium and formed at least at one of both ends of, respectively, each of said plurality of recording tracks.

4,885,459

DEVICE AND SYSTEM FOR ENCODING A SUBSTRATE WITH AN INK

Jase O. Norsworthy, 2708 First Ave., North, Ste. 500, Billings, Mont. 59103

Filed Sep. 29, 1987, Ser. No. 102,517
Int. Cl.[4] G06K 1/12, 19/06
U.S. Cl. 235—495 17 Claims



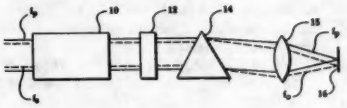
1. A device for encoding a check or other debit or credit instrument, comprising an upper element comprised of a material essentially impermeable to ink materials and having marked thereon a grid comprising rows and columns of identifying marks beside each of which are situated corresponding pressure transmissive areas,
an intermediate element of carrier material permeated with at least one ink material, and
a lower element comprised of a material impermeable to inks the same size as the upper element and having perforations corresponding to the pressure transmissive areas of the upper element, said upper and lower elements being attached, and said intermediate element being situated between said upper and lower element

4,885,460

DEVICE TO DETECT FREQUENCY CONVERTED SIGNALS WITH HIGH EFFICIENCY

Bruce J. Bartholomew, Poway, Calif., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Apr. 25, 1988, Ser. No. 185,580
Int. Cl.[4] H01J 3/14
U.S. Cl. 250—216 7 Claims



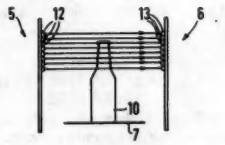
1. A high efficiency combined optic and electrical device for detecting the strength of a very weak optic signal in the presence of a strong pumping optic signal of a slightly different frequency comprising:
a first optic means for generating an output signal including both said very weak and very strong optic signals;
a second optic means for greatly attenuating said very strong optic signal while passing said very weak optic signal with minimum attenuation;
a third optic means for separating said very weak optic signal from the remaining very strong optic signal;
a fourth optic means for focusing the optic output signals from said third optic means; and
a pair of optic to electrical converting means, said first, second, third and fourth optic means being positioned so that each of said substantially equal intensity optic signals are directed to a separate one of said optic to electrical converting means and said very weak optic signal is direct to only one of said optic to electrical converting means.

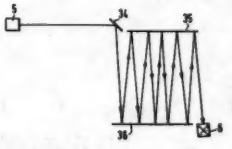
4,885,461

OBJECT IDENTIFYING DEVICE

Timo Mattila, and Juha Elf, both of Kausala, Finland, assignors to Halton Oy, Finland

Filed Mar. 2, 1988, Ser. No. 162,872
Claims priority, application Finland, Mar. 2, 1987, 870904
Int. Cl.[4] G01N 9/04
U.S. Cl. 250—223 B 16 Claims





1. Device for identifying objects, comprising
illumination means for illuminating the objects,
a detector for examining the illuminated objects,
said illumination means and detector being situated opposite one another,

means for increasing optical length of said device from said illumination means to said detector without increasing structural dimensions of said device, which comprise

a mirror system situated between said illumination means and detector in a horizontal direction,

whereby reflections of the objects by said mirror system do not turn in a vertical direction.

4,885,462

OPTICAL FIBER SENSING SYSTEMS

John P. Dakin, Hampshire, England, assignor to Plessey Overseas Limited, Ilford, England

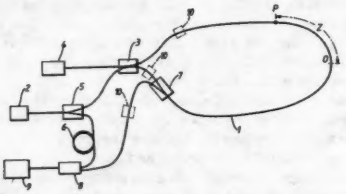
PCT No. PCT/GB87/00265, § 371 Date Feb. 16, 1988, § 102(e) Date Feb. 16, 1988, PCT Pub. No. WO87/06690, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 22, 1987, Ser. No. 160,601

Claims priority, application United Kingdom, Apr. 22, 1986, 8609732

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **5 Claims**



1. An optical fibre sensing system for measuring the location and/or magnitude of an external parameter acting at a single point along an optical fibre loop sensor, in which the system comprises light source means for producing light for propagation in opposite directions around said loop sensor, directional coupler means for coupling said light source means and detector means to said loop sensor and to other optical fibre interfering paths of the system, in which the detector means are arranged for measuring a phase change (x) between interfering light signals propagating around the sensor loop in opposite directions and for simultaneously measuring a phase change (y) experienced by the light propagating around the loop sensor in one direction, whereby, by computation or otherwise, the rate of change of the phase change (x) can be derived and by the use of the algorithm herein defined the location and/or magnitude of the applied parameter can be determined.

4,885,463

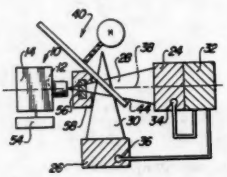
METHOD AND APPARATUS FOR TESTING INFRARED DETECTORS

William H. Wellman, Goleta, and John E. Stannard, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Aug. 29, 1988, Ser. No. 237,911

Int. Cl.[4] G01D *18/00*; G01J *1/00*

U.S. Cl. 250—252.1 **20 Claims**



11. Apparatus for testing an infrared detector having a cryogenically cooled array mounted in a dewar, the array having a given field of view along an optical axis, said apparatus comprising:

a first blackbody source for providing a first broad beam of infrared radiation along the optical axis towards said array;

a second blackbody source for providing a second broad beam of infrared radiation directed at an angle relative to the optical axis so that said second beam is not normally incident the array;

temperature control means connected between the first and second blackbody sources for maintaining a constant temperature differential therebetween and for maintaining both sources at a temperature below 400° Kelvin; and

means for intercepting the beams and redirecting them so that the first and second beams are alternately incident the array.

4,885,464

IMPROVEMENTS RELATING TO A METHOD OF RADIOISOTOPE IMAGING

Peter A. E. Stewart, Bristol, and Michael R. Hawkesworth, Birmingham, both of England, assignors to Rolls-Royce plc, England

Filed Jul. 14, 1988, Ser. No. 218,879

Claims priority, application United Kingdom, Jul. 24, 1987, 8717653

Int. Cl.[4] G01N *23/00*

U.S. Cl. 250—308 **6 Claims**

1. A method radioisotope imaging of a mechanical structure comprising the step of providing on at least part of the structure in a region of interest a surface layer in the form of an applied film containing radioisotope material selected from the group consisting of 68Ga, 18F, 124I, 22Na, 45Ti, 58Co and 65Zn.

4,885,465

SPECTRUM DISPLAY DEVICE FOR X-RAY MICROANALYZER OR THE LIKE

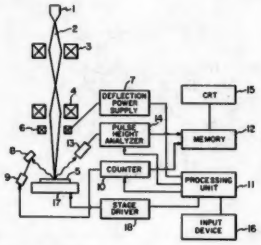
Yoshitaka Nagatsuka; Masaki Saito, and Yoshitaka Kawabe, all of Tokyo, Japan, assignors to JEOL, Ltd., Tokyo, Japan

Filed Jul. 5, 1988, Ser. No. 215,222

Claims priority, application Japan, Jul. 10, 1987, 62-172358

Int. Cl.[4] G01N *23/04*

U.S. Cl. 250—310 **3 Claims**



1. A spectrum display device for use with an electron beam device which irradiates the surface of a specimen with an electron beam to produce x-rays from the specimen and includes a wavelength-dispersive x-ray spectrometer, and an energy-dispersive x-ray spectrometer, said display device comprising:

a display means having a viewing screen on which spectra obtained from the same region on the specimen by the two x-ray spectrometers are simultaneourly displayed;

an input device for permitting one to designate a desired chemical element; and

said spectrum display device including means which superimposes markers on the spectra displayed on the display means, the markers indicating the energies and wavelength of characteristic x-rays emanating from the element designated by the designation means.

4,885,466

CORONA WIRE CLEANING DEVICE UTILIZING A POSITION DETECTION SYSTEM

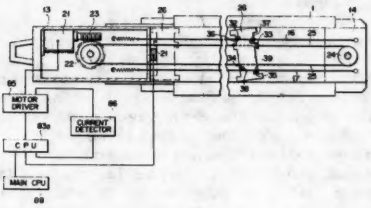
Yasushi Koichi, Yamato; Haruzi Mizuishi, Tokyo; Mutuko Funaki, and Tetsuya Fujioka, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,102

Claims priority, application Japan, Sep. 25, 1987, 62-240254; Oct. 30, 1987, 62-275232; Nov. 12, 1987, 62-286325; Jul. 29, 1988, 63-189737

Int. Cl.[4] H01J *37/26*

U.S. Cl. 250—324 **4 Claims**



1. A wire cleaning device comprising cleaning means movable for cleaning a charging wire in a corona discharger, a motor for moving the cleaning means, position detecting means for detecting the position of the cleaning means, failure detecting means for detecting a movement failure of the cleaning means, and lock determining means for determining whether the cleaning means is locked in a moving stroke thereof based on information detected by the failure detecting means and the position detecting means.

4,885,467

SHADING ELIMINATION METHOD

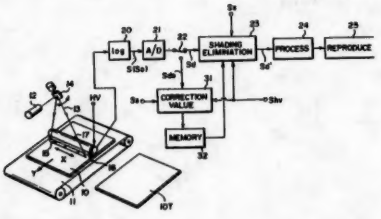
Kazuo Horikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 10, 1988, Ser. No. 205,243

Claims priority, application Japan, Jun. 10, 1987, 62-144980

Int. Cl.[4] G01N *23/04*; H04M *1/40*

U.S. Cl. 250—327.2 **4 Claims**



1. A shading elimination method in an image readout apparatus for scanning a light beam on a recording medium carrying an image recorded thereon, obtaining light which carries the image by the scanning, and detecting the light by use of a photomultiplier to obtain read-out signals carrying the image, the shading elimination method in an image readout apparatus which comprises the steps of:

(i) detecting the shading characteristics in the direction of main scanning of said light beam by changing the level of high voltage applied to said photomultiplier to a plurality of levels prior to said detection of said light,

(ii) storing said shading characteristics to correspond to said levels of said high voltage in a storage means,

(iii) detecting the level of said high voltage at the time of said detection of said light, and reading said shading characteristics that correspond to the detected level of said high voltage from said storage means, and

(iv) correcting said read-out signals in accordance with said shading characteristics read from said storage means so that changes in the output of said photomultiplier caused by the shading are eliminated.

4,885,468

RADIATION IMAGE RECORDING APPARATUS, AND STIMULABLE PHOSPHOR SHEET FEEDING AND LOADING APPARATUS

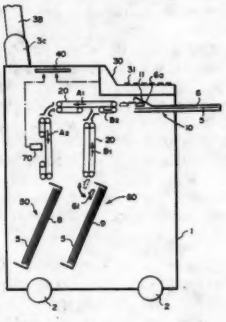
Kazuo Shimura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1988, Ser. No. 217,209

Claims priority, application Japan, Jul. 13, 1987, 62-174550; Jul. 13, 1987, 62-174552

Int. Cl.[4] G01N *23/04*

U.S. Cl. 250—327.2 **9 Claims**



1. A radiation image recording apparatus comprising:

(i) a mobile case,

(ii) a radiation source connected with said case,

(iii) a cassette holding section provided at a part of said case for releasably holding a cassette capable of housing a stimulable phosphor sheet therein,

(iv) a first magazine holding section provided inside of said case for releasably holding a sheet housing magazine capable of housing a plurality of image-recorded stimulable phosphor sheets therein,

(v) a second magazine holding section provided inside of said case for releasably holding a sheet feed magazine capable of housing a plurality of stimulable phosphor sheets usable for image recording therein, and provided with a take-out means for taking said stimulable phosphor sheets one by one out of said sheet feed magazine, and

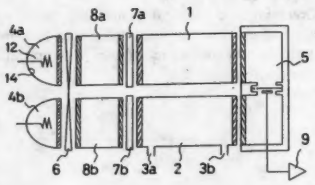
(vi) a sheet conveyance means for conveying said stimulable phosphor sheet, which is taken out of said cassette, into said first magazine holding section, and conveying a stimulable phosphor sheet usable for image recording, which is taken out of said second magazine holding section, into said cassette.

4,885,469

INFRARED GAS ANALYZER

Yutaka Yamagishi, and Kenji Takeda, both of Kyoto, Japan, assignors to Horiba Ltd., Kyoto, Japan

Filed May 16, 1988, Ser. No. 194,491
Claims priority, application Japan, Jun. 10, 1987, 62-145959
Int. Cl.[4] G01N *21/26*
U.S. Cl. 250—345 **13 Claims**



1. In an improved infrared gas analyzer, the improvement comprising:

a light source for providing radiation including a desired spectrum of infrared radiation;

a sample gas cell for receiving and containing a specimen of gas to be analyzed;

a first gas filter cell having a predetermined charge of a gas capable of absorption of wavelengths of radiation from the light source outside the desired spectrum of infrared radiation;

a first interference filter designed to reflect wavelengths of radiation from the light source outside the desired spectrum of infrared radiation while passing the desired spectrum of infrared radiation;

a detector for measuring the absorption of the spectrum of infrared radiation within the sample gas cell, and

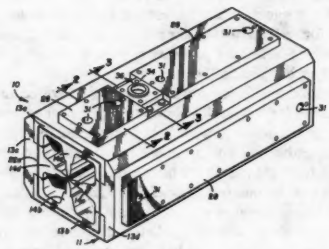
means for positioning the first gas filter cell and first interference filter, respectively, in that order between the light source and the sample gas cell, whereby a repetitive attenuated absorption of radiation outside the desired spectrum of infrared radiation can be accomplished by an initial absorption in the first gas filter cell, the reflection of the first interference filter, and the subsequent absorption of the reflected radiation by the first gas filter cell.

4,885,470

INTEGRALLY FORMED RADIO FREQUENCY QUADRUPOLE

Steven R. Abbott, Concord, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 5, 1987, Ser. No. 104,026
Int. Cl.[4] H01J *39/36*
U.S. Cl. 250—396 R **2 Claims**



1. A radio frequency quadrupole comprising:

four separate structural elements each having a wall and a vane integral therewith, the walls of said four structural elements butting against each other to form an elongated housing having an elongate central axis and top, bottom and two side walls symmetrically disposed about said central axis,

the vanes integral with said top and bottom walls constituting a first pair of vanes projecting from said top and bottom walls and extending lengthwise along said walls, said vanes of said first pair each having a cross-section substantially at right angles to said central axis which tapers inwardly towards said central axis to form a first pair of blade-shaped confronting tips spaced apart by a first predetermined distance,

the vanes integral with said side walls constituting a second pair of vanes projecting from said side walls and extending lengthwise along said side walls, said vanes of said second pair each having a cross-section normal to said central axis which tapers inwardly towards said central axis to form a second pair of blade-shaped confronting tips spaced apart by a second predetermined distance and at substantially right angles to said first pair of tips,

each structural element having a central lengthwise plane passing through the tip of the vane of said structural element,

each structural element having two first flat surfaces on its wall, said first flat surfaces being normal to the central plane of said structural element, one on each side of said central plane and extending the length of the wall,

each structural element having two second flat surfaces on its wall, said second flat surfaces being parallel to the central plane of said structural element, one on each side of said central plane and extending the length of the wall,

each of the walls of said four structural elements having the first and second flat surfaces thereof butted against the second and first flat surfaces, respectively, of the walls adjacent thereto,

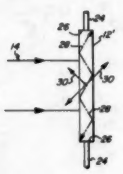
each of the vanes of said four structural elements having two flat surfaces thereon parallel to its central plane and spaced from its tip, said flat surfaces extending the length of said vane, one on each side of said central plane, to provide high precision reference surfaces from which the location of vane modulations on the vane tips may be accurately verified.

4,885,471

ULTRAVIOLET RADIOMETER

William B. Telfair, Newtown; Clifford A. Martin, Bridgeport, both of Conn.; Eugene I. Gordon, Pacific Palisades, Calif., and William C. Fricke, New Fairfield, Conn., assignors to Taunton Technologies, Inc., Monroe, Conn.

Filed Apr. 22, 1988, Ser. No. 185,867
Int. Cl.[4] G01J *1/58*
U.S. Cl. 250—461.1 **22 Claims**



1. An ultraviolet radiometer, comprising:

means for converting incident UV radiation to fluorescent radiation, said UV radiation converting means being a plate constructed of fluorescent optically transparent material selected from undoped crystal, said undoped crystal being a sapphire;

means for detecting the fluorescent radiation, the detecting means including means for converting the optical signal

corresponding to the power of detected fluorescent emission radiation to an electrical signal; and

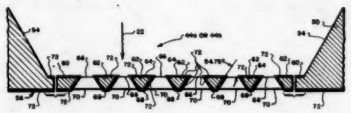
means operatively connected with said detecting means to translate the electrical signal to indicate the power or energy of the UV radiation.

4,885,472

SILICON GRID AS A REFERENCE AND CALIBRATION STANDARD IN A PARTICLE BEAM LITHOGRAPHY SYSTEM

Lydia J. Young, Palo Alto, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 14, 1988, Ser. No. 167,601
Int. Cl.[4] G01H *21/00*; G01D *18/00*
U.S. Cl. 250—491.1 **11 Claims**



1. In a particle beam lithography system having a beam column and particle beam directed toward a workpiece for processing a workpiece located on a X-Y stage, binary electronic means for deflecting said particle beam in an X and Y direction, means for driving said X-Y stage in an X and Y direction and means for sensing the position of the X-Y stage and sending signals of said stage position to said binary means, the improvement comprising,

a reference and calibration grid having a plurality of square openings formed in a silicon die said grid being calibrated for direct coordination with the binary electronic system and said silicon die being much larger than said grid for easy handling and mounting in said system,

means connecting said grid to said X-Y stage, and

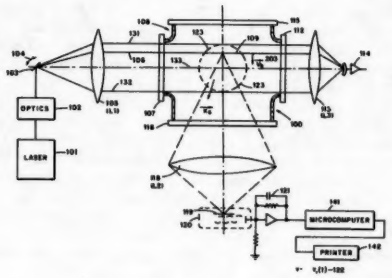
means cooperating with said grid to provide calibration signals whereby the grid may serve as a global reference location, as a reference for writing plane location and a reference to set up the particle beam column.

4,885,473

METHOD AND APPARATUS FOR DETECTING PARTICLES IN A FLUID USING A SCANNING BEAM

Frederick M. Shofner; Arthur C. Miller, Jr., and Gerhard Kreikebaum, all of Knoxville, Tenn., assignors to Shofner Engineering Associates, Inc., Knoxville, Tenn.

Filed Apr. 29, 1988, Ser. No. 188,500
Int. Cl.[4] G01N *15/06*
U.S. Cl. 250—574 **19 Claims**



1. An apparatus for detecting particles in a fluid comprising:

a sample volume;

input means for admitting radiation into said sample volume;

conduit means for directing a flow of fluid and particles in a path through said sample volume, said particles collectively having an average particle size and an average distance between adjacent particles;

a source of radiation for producing a radiation beam having a cross-sectional dimension that is larger than the average particle size but is smaller than the average distance between adjacent particles;

scanning means for producing a scanning beam from said radiation beam that moves between at least first and second scan positions at a scan rate;

radiation directing means for directing the scanning beam through said input means into said sample volume and into the path of fluid and particles so that particles are hit by the scanning beam substantially one particle at a time and produce scattered radiation; and

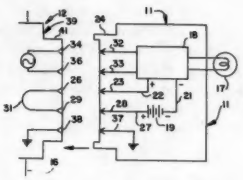
means for detecting the scattered light produced by the particles when hit by the scanning beam and for producing a detection signal substantially corresponding to at least one parameter of individual detected particles.

4,885,474

CONNECTOR ASSEMBLY FOR PLUG-IN ENERGIZATION AND BATTERY ACTIVATION OF AN ASSOCIATED ELECTRICAL APPARATUS

Robert M. Johnstone, Fairfield, and Joseph S. Wegrzyn, Stratford, both of Conn., assignors to Dual Lite, Inc., Newtown, Conn.

Filed Mar. 15, 1989, Ser. No. 323,673
Int. Cl.[4] H02J *7/00*
U.S. Cl. 307—66 **14 Claims**



1. A wall-mounted battery-powered emergency lighting fixture for plug-in installation in a wall connector presented by a wall-mounted junction box comprising

a wall plate mounted on the junction box incorporating first aperture means through which a first multi-terminal connector protrudes in clamped position,

a back plate, dimensioned for facing mated juxtaposition with said wall plate, mounted on the emergency lighting fixture, incorporating second aperture means through which a second multi-terminal connector is presented for mating plug-and-socket engagement with the first multi-terminal connector,

latch means operatively mounted between said plates for releasable latching engagement therebetween when said two plates are in mated juxtaposition,

a re-chargeable electrical storage battery mounted in said lighting fixture,

electrical circuitry in said fixture incorporating a battery re-charging circuit and a transfer circuit for connecting the re-chargeable battery to a lamp for operation during a failure of line power,

conductor means in said lighting fixture connecting one terminal of the re-chargeable storage battery to one terminal of said electrical circuitry by way of two prongs and mating sockets in said multi-terminal connectors, and

a jumper conductor positioned within the junction box joining the two prongs and mating sockets,

providing a permanent connection of the battery terminal with the electrical circuitry terminal when the multi-terminal con-

nectors are in mating plug-and-socket engagement, and isolating the battery terminal from the electrical circuitry terminal whenever the multi-terminal connectors are disengaged.

4,885,475

PRECISION 50 PERCENT DUTY CYCLE CONTROLLER

Joseph P. Farina, Southwick, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 9, 1988, Ser. No. 242,936

Int. Cl.[4] H03K *5/00, 5/22, 5/08;* H03F *3/45*

U.S. Cl. 307—261 **1 Claim**

1. A duty cycle controller, comprising:

an amplifier, responsive to a sinusoidal signal, for providing a trapezoidal signal;

a differential transistor pair having equal collector circuit resistances, responsive to a supply voltage and to said trapezoidal signal, for providing a current alternatively through each transistor of said differential pair and for providing square waves at said collectors;

a current regulator, responsive to said current, for regulating said current in proportion to said supply voltage divided by half said collector resistance; and

an integrator, responsive to a voltage on the collector of one of the transistors of said differential pair, for providing a signal to the base of the other one of said differential pair for regulating the average value of said square waves to zero.

4,885,476

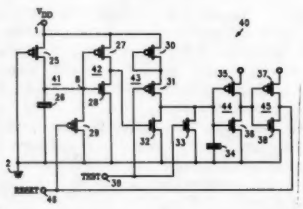
POWER-ON RESET CIRCUIT

John K. Mahabadi, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1989, Ser. No. 319,247

Int. Cl.[4] H03K *17/22, 17/20, 17/687, 5/153*

U.S. Cl. 307—272.3 **11 Claims**



1. An MOS power-on reset circuit having at least one threshold voltage for generating a reset signal when a first supply voltage is applied to said power-on reset circuit, comprising;

first means coupled to the first supply voltage for generating a start-up voltage wherein the start-up voltage is substantially unaffected by variations in said at least one threshold voltage;

second means coupled to said first means for generating a trigger voltage in response to the start-up voltage;

a current source coupled to the first supply voltage;

a first capacitor coupled between said current source and a second supply voltage;

third means coupled to said current source and to said second means and responsive to the trigger voltage for steering a current from said current source to said first capacitor; and

a driver means coupled to said first capacitor for producing the reset signal and further coupled to said first means for reducing the steady state current to substantially zero.

4,885,477

DIFFERENTIAL AMPLIFIER AND CURRENT SENSING CIRCUIT INCLUDING SUCH AN AMPLIFIER

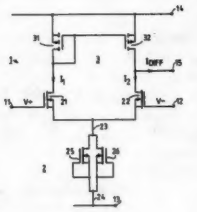
Philip H. Bird, Sidcup, and Desmond R. Armstrong, Wallington, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

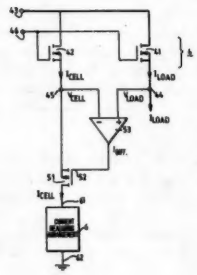
Filed Jun. 6, 1988, Ser. No. 203,404

Claims priority, application United Kingdom, Jun. 8, 1987, 8713387

Int. Cl.[4] H03K *3/01;* H03F *3/45*

U.S. Cl. 307—296.8 **12 Claims**





5. A current sensing circuit for sensing an output current of a power semiconductor arrangement, which arrangement has major and minor current carrying sections, each section comprising at least one basic semiconductor element, said major and minor current carrying sections having a common first electrode and corresponding major and minor second electrodes, the current sensing circuit comprising:

means for comparing the voltages at the major and minor second electrodes; means for controlling a current drawn from the minor second electrode in response to an output of the comparing means so as to cause the voltage at the minor second electrode to end to substantial equality with that at the major second electrode; and means for measuring the current drawn from the minor second electrode, wherein the comparing means comprises a differential amplifier comprising first and second matched field-effect transistors (FETs) having their source electrodes connected together and to a current source, and their drain electrodes connected respectively to an input and an

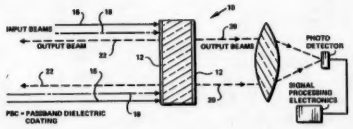
output of a current mirror circuit, the junction of the output of the current mirror circuit and the drain electrode of the second FET forming a tap for output current of the differential amplifier, characterized in that said first and second FETs are depletion-mode FETs, and in that said current source comprises parallel-connected third and fourth depletion-mode FETs matched to the first and second FETs, each of the third and fourth FETs having its gate and source electrodes connected together and to a voltage supply, and its drain electrode connected to the source electrodes of the first and second FETs, means being provided for coupling the gate electrodes of the first and second FETs respectively to the major and minor second electrodes of the power semiconductor arrangement.

4,885,478

TECHNIQUE TO IMPROVE THE EFFICIENCY OF NONLINEAR OPTICAL PROCESSES

Bruce J. Bartholomew, Poway, Calif., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.

Filed Jul. 25, 1988, Ser. No. 225,112
Int. Cl.[4] H03F 7/00
U.S. Cl. 307—425 **5 Claims**



1. Nonlinear optical system for improving the output efficiency of the combining of at least two out of phase light beams of different frequencies into a light beam of a third frequency without the aid of phase matching comprising:

nonlinear material for receiving and mixing said at least two out of phase light beams into a single combined light beam of a frequency different than either of said out of phase light beams, said nonlinear material having a first surface for receiving said light beams of different frequencies and at least one second output surface for passing said single combined light beam of a different frequency from said nonlinear material;

a passband coating formed from multiple layers of dielectric material positioned on said first and at least one second output surface, said combined thickness of said nonlinear material and said dielectric coating having a thickness of approximately the coherence length of the frequency of said single combined light beam, said dielectric having a peak transmittance at the frequency of said single combined light beam; and

means for collecting said single combined light beam leaving said at least one output surface.

4,885,479

BUFFER AMPLIFIER CIRCUIT

Atsushi Oritani, Kanagawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 320,764, Nov. 12, 1980, abandoned. This application Oct. 4, 1984, Ser. No. 658,055
Claims priority, application Japan, Nov. 12, 1980, 55-159170
Int. Cl.[4] H03K 17/687, 17/14, 19/092, 3/356
U.S. Cl. 307—443 **12 Claims**

1. A buffer amplifier circuit comprising a first inverter having a buffer input terminal and buffer output terminal and including

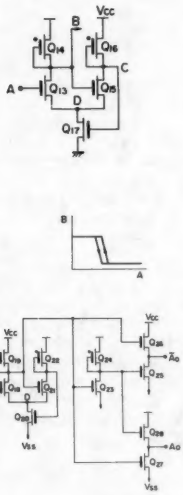
a first driver transistor having a drain operatively connected to said output terminal of said buffer amplifier, a source, and a gate electrode connected to said buffer input terminal to receive an input signal, and

a first load connected to the drain of said first driver transistor and to receive a power supply voltage; a second inverter having an output and including

a second driver transistor having a drain corresponding to said output of said second inverter, a gate electrode connected to receive the output signal from said first inverter and having a source electrode connected to the source electrode of said first driver transistor, and

a second load connected to the drain of said second driver transistor and to receive said power supply voltage;

a control transistor having a drain electrode connected to



the source electrodes of said first and second driver transistors and having a gate connected to said output of said second inverter and having a source operatively connected to receive a second voltage being less than said power supply voltage, the potential of the gate of said control transistor being controlled by said second inverter so that the potential of said connected source electrodes is varied so as to change the potential between the gate and source electrodes of said first driver transistor in such a way that, when said first driver transistor is being turned from OFF to ON, said control transistor is completely turned ON, and when said first driver transistor is being turned from ON to OFF, said control transistor is completely turned OFF.

4,885,480

SOURCE FOLLOWER FIELD-EFFECT LOGIC GATE (SFFL) SUITABLE FOR III-V TECHNOLOGIES

Aziz I. Faris, Upper Macungie Township, Lehigh County, and Perry J. Robertson, Spring Township, Berks County, both of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 23, 1988, Ser. No. 235,862
Int. Cl.[4] H03K 19/94
U.S. Cl. 307—448 **18 Claims**

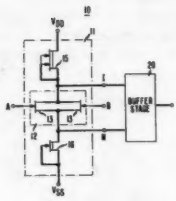
1. An integrated circuit having at least one logic gate, each logic gate having:

a logic stage, having at least one logic signal input and first

and second output nodes, for performing predetermined logic functions on the logic signal input; and,

a first depletion FET, with a first output node coupling to a first power source and with a gate terminal and a second output terminal coupling to the first output node of the logic stage, forming a pull-up laod for the logic stage;

CHARACTERIZED BY:



a second depletion FET, with a first output terminal coupling to the second output node of the logic stage and with a gate terminal and a second output terminal coupling to a second power source, forming a pull-down load for the logic stage;

wherein signals on the first and second output nodes of the logic stage are the logical inverse of each other.

4,885,481

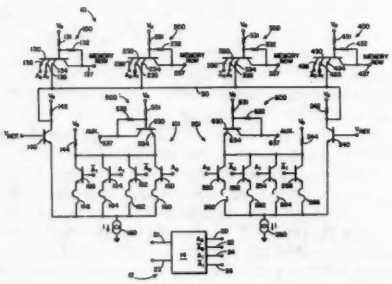
CONFIGURABLE MEMORY ADDRESS DECODER FOR INTEGRATED MEMORY CIRCUITS WITH AUXILIARY MEMORY LOCATIONS

James B. Hobbs, Minneapolis, and Jeffrey P. Graebel, Maple Grove, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 17, 1988, Ser. No. 209,147

Int. Cl.[4] H03K *19/013, 19/086, 17/04, 19/007*

U.S. Cl. 307—463 **15 Claims**



1. A configurable decoding circuit, which comprises:

means, for receiving various input signals and responsive thereto, and for providing differing sets of actuation signals;

a plurality of select signal generators, each being electrically coupled to the actuation signals providing means for responding to a different unique set of actuation signals for generating a select signal on an output, terminal;

at least a first configurable means for generating a cancel select signal and an auxiliary actuation signal in response to a selectable set of actuation signals;

means for transmitting the cancel select signal to the plurality of select signal generators for preventing them from generating select signals; and

an auxiliary select signal generator connected to each configurable means and responsive to an auxiliary actuation signal generated thereby for generating a select signal on an output terminal.

4,885,482

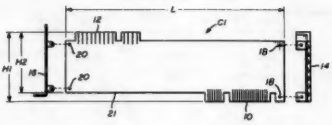
MULTIPLE COMPUTER INTERFACE CIRCUIT BOARD

David P. Sharp, Houston; Charles H. Lee, Cypress, and Thomas Cassidy, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Jul. 13, 1988, Ser. No. 218,652

Int. Cl.[4] G06F *13/38*

U.S. Cl. 307—465 **14 Claims**



1. A circuit board for use with systems having a mother board for inclusion of additional circuit boards in the systems, the interfaces between the mother boards and the additional circuit boards of first and second systems conforming to first and second mutually incompatible interface standards, comprising:

circuit board means for locating and connecting circuitry and for connection to a mother board,

said circuit board means having a first interface means for connecting said circuit board means to the first interface standard, said first interface means being located on a side of said circuit board means, and

said circuit board means having a second interface means for connecting said circuit board means to the second interface standard, said second interface means being located on a side of said circuit board means.

4,885,483

LOGARITHMIC AMPLIFIER

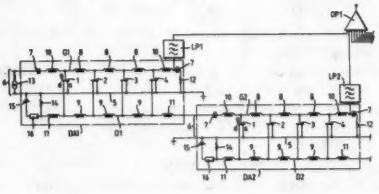
Colin S. Aitchison, Redhill, England, assignor to ERA Patents Limited, Leatherhead, England

Filed Mar. 9, 1989, Ser. No. 321,507

Claims priority, application United Kingdom, Mar. 10, 1988, 8805672

Int. Cl.[4] G06G *7/24*

U.S. Cl. 307—492 **8 Claims**



1. In a logarithmic amplifier comprising a series of MESFET

distributed amplifiers connected in cascade, each of said MESFET distributed amplifiers having a gate transmission line a drain transmission line a common ground line, a plurality of MESFETs connected in parallel, gate electrodes of said MESFET being connected at spaced intervals along said gate transmission line, drain electrodes of said MESFETs being connected at spaced intervals along said drain transmission line and source electrodes of said MESFETs being connected to said ground line;

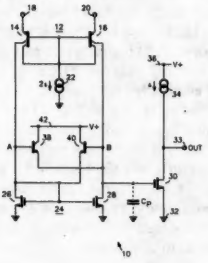
the improvement wherein said logarithmic amplifier also includes low pass filter means operatively connected to said gate transmission line of each distributed amplifier, said low pass filter means passing only a rectified component of said travelling wave passing along each gate transmission line, and summer means connected to said low pass filter means to provide an output, said summer providing an output of said logarithmic amplifier.

4,885,484

VOLTAGE CLAMPED DIFFERENTIAL TO SINGLE ENDED CONVERTER CIRCUIT

Randall C. Gray, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1988, Ser. No. 215,118
Int. Cl.[4] C06G 7/12
U.S. Cl. 307—495 **7 Claims**



1. A differential to single ended converter circuit coupled to first and second current paths in which differentially related currents flow for providing a single output signal, comprising:

a pair of MOS transistors each having gate, drain and source electrodes, said drain and gate of the first on of said pair of MOS transistors being coupled together, said drain and source of the first one of said pair of MOS transistors being coupled in the first current path, said gate of the second one of said pair of MOS transistors being coupled to said gate of said first transistor of said pair of MOS transistors and said drain and source of said second transistor of said pair of MOS transistors being coupled in the second current path;

a first transistor having first, second and control electrodes, said first electrode being coupled to said drain electrode of said first transistor of said pair of MOS transistors, said second electrode being coupled to a power supply conductor, and said control electrode being coupled to said drain electrode of said second transistor of said pair of MOS transistors; and

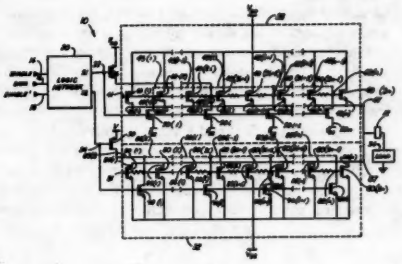
a second transistor having first, second and control electrodes, said first electrode being coupled to said drain electrode of said second transistor of said pair of said MOS transistors, said second electrode being coupled to said power supply conductor and said control electrode being coupled to said drain electrode of said first transistor of said pair of MOS transistors.

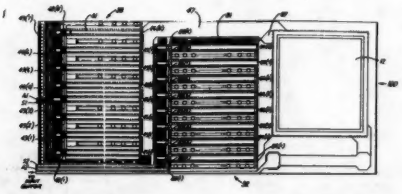
4,885,485

CMOS OUTPUT BUFFER PROVIDING MASK PROGRAMMABLE OUTPUT DRIVE CURRENT

William W. Leake, Eagan, and Rai Surinder, Plymouth, both of Minn., assignors to VTC Incorporated, Bloomington, Minn.

Filed Aug. 30, 1988, Ser. No. 238,565
Int. Cl.[4] H03K 3/013, 5/13, 17/28, 17/687
U.S. Cl. 307—542 **26 Claims**





1. An output buffer for prescribing different parameters of an output signal appearing on an output terminal, the output buffer comprising:

a pull-up circuit responsive to a first signal for pulling the output signal toward a first potential level, the pull-up circuit including a plurality of output driver transistors, each driver transistor having an input electrode, an output electrode and a control electrode, the control electrodes being interconnection through different metallization patterns for prescribing a time rate of response of the pull-up circuit to the first signal; and

a pull-down circuit responsive to a second signal for pulling the output signal toward a second potential level, the pull-down circuit including a plurality of output driver transistors, each driver transistor having an input electrode, an output electrode and a control electrode, the control electrodes being interconnection through different metallization patterns for prescribing a time rate of response of the pull-down circuit to the second signal.

4,885,486

DARLINGTON AMPLIFIER WITH HIGH SPEED TURNOFF

Sampat S. Shekhawat; John J. Dhyanchand, both of Rockford, and John Horowy, Roscoe, all of Ill., assignors to Sundstrand Corp., Rockford, Ill.

Filed Dec. 21, 1987, Ser. No. 135,226
Int. Cl.[4] H03K 17/04, 17/56
U.S. Cl. 307—570 **14 Claims**

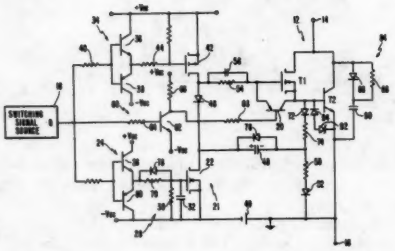
1. A circuit which is conductive to permit current flow between first and second terminals in response to application of a first level of a switching signal to an input and which is not conductive to block current flow between the first and second

terminals in response to application of a second level of the switching signal to the input comprising:

(a) an output bipolar transistor having a collector connected to the first terminal, an emitter connected to the second terminal, and a base;

(b) an input field effect transistor having one of a source and drain connected to the first terminal and another of the source and drain connected to the base of the bipolar transistor and a gate coupled to the input, the field effect transistor turning on in response to the first level of the switching signal at the input and turning off in response to a second level of the switching signal at the input and the bipolar transistor turning on in response to turning on of the field effect transistor to conduct current between the first and second terminals and turning off in response to turning off of the field effect transistor to block current flow between the first and second terminals;

(c) a first switch having first and second terminals with the first terminal of the first switch being connected to the gate of the field effect transistor and the second terminal of the first switch being connected to one of the source



and drain of the field effect transistor, the first and second terminals of the first switch being short-circuited together in response to the second level of the switching signal being applied to the input and being open-circuited from each other upon application of the first level of the switching signal to the input, the input being coupled to a control terminal of the first switch;

(d) first switching means, coupled between the base of the bipolar transistor and a first reference potential, having first and second terminals which are short-circuited together upon application of a first level of a control signal to a control terminal of the first switching means to cause transfer of minority carriers from the base to the first reference potential and which are open-circuited upon application of a second level of the control signal; and

(e) means, responsive to the switching signal, for generating a first level of the control signal after the field effect transistor has turned off prior to the turning-off of the bipolar transistor and for generating a second level of the control signal in response to the switching signal changing to the first level.

4,885,487

ELECTROMAGNETIC OSCILLATION MOTOR

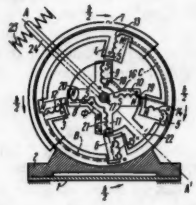
Robinzon I. Ksovreli; Alexandr K. Didebulidze, both of Tbilisi; Valery K. Kochiev, and Amiran F. Gasseev, both of Takhinvali, all of U.S.S.R., assignors to Gruzinsky Selskokhozyaistvenny Institut, Tbilisi-Digomi, U.S.S.R.

PCT No. PCT/SU86/00088, § 371 Date May 11, 1988, § 102(e) Date May 11, 1988, PCT Pub. No. WO88/02193, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 16, 1986, Ser. No. 236,528

Int. Cl.[4] H02K *33/00*

U.S. Cl. 310—36 **1 Claim**



1. An electromagnetic oscillation motor comprising a symmetrical four-pole armature with a DC winding and an asymmetrical four-pole stator with an AC winding made up of two parallel-connected paths, each said path including two series-connected coils (12, 13 and 14, 15), characterized in that the adjacent stator poles (3, 4) forming one pair are offset in opposite directions, while adjacent poles (5, 6) forming another pair are offset toward each other with respect to the axes of symmetry of respective poles (8, 9 and 10, 11) of the armature to a distance (b/2) equal to one half of the width (b) of stator poles, each path of the AC winding being received on the respective pair of adjacent stator poles (3, 4 and 4, 6), and, the coils (18, 19 and 20, 21) of the DC winding are connected in pairs in a matched-series fashion and received on the adjacent poles (9, 10 and 8, 10) of the armature, the pairs of coils (18, 19 and 20, 21) being connected in opposition.

4,885,488

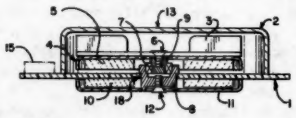
MINIATURIZED FAN FOR PRINTED CIRCUIT BOARDS

Ned Cox, Jonesborough, Tenn., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 23, 1988, Ser. No. 197,224

Int. Cl.[4] H02K *29/08, 5/04*

U.S. Cl. 310—68 R **11 Claims**



1. A cooling fan for a PWB comprising:

a plurality of electromagnets adapted to be mounted closely adjacent and spaced from one surface of a PWB;

a rotatably mounted permanent magnet means adapted to be mounted adjacent an opposing surface of the PWB in magnetically couplable relation with said electromagnets to be movable in response to magnetic fields established by the electromagnets for receiving air and expelling said air at increased speed; and

means adapted to be secured in said PWB for rotatably mounting said rotatably mounted permanent magnet thereon at said opposing PWB surface and for mounting

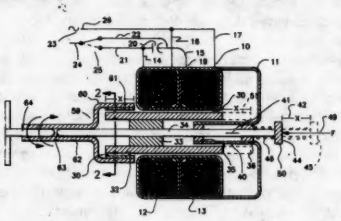
said electromagnets thereon at said one PWB surface in said magnetically couplable relation.

4,885,489

PERMANENT MAGNET MOTOR WITH HYSTERESIS DRAG CUP COUPLING

Leslie P. Stuhr, Corcoran, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 30, 1988, Ser. No. 175,454
Int. Cl.[4] H02K *7/12, 49/04*
U.S. Cl. 310—78 **13 Claims**



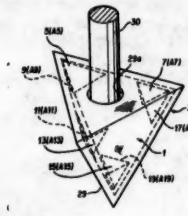
11. A permanent magnet, alternating current energized motor with hysteresis output coupling means, including: annular stator means having a pair of coils adapted to be energized from an alternating current source with the energization of said coils shifted in phase to effectively create a rotating magnetic field; said stator means having a central opening in which said rotating magnetic field is applied; permanent magnet rotor means having mounting means to mount said rotor means within said central opening of said stator means; said rotor mounting means providing for rotation of said rotor means; said rotor means having a length exceeding a length of said stator opening; hysteresis drag cup output means mounted for rotation with an axis of rotation corresponding to an axis of rotation for said rotor means; and said permanent magnet rotor means magnetically coupled to said hysteresis drag cup output means causing transfer of torque to said output means when said rotor means is rotating.

4,885,490

NON-CONTACT POSITIONING DEVICE

Kenichi Takahara, and Hiroshi Takahashi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 6,428, Jan. 23, 1987, abandoned. This application Sep. 15, 1988, Ser. No. 244,660
Claims priority, application Japan, Jan. 24, 1986, 61-12059
Int. Cl.[4] F16C *39/06*
U.S. Cl. 310—90.5 **18 Claims**



1. A non-contact positioning device for driving and positioning a subject fixed on a driven body which multiple axes comprising

a driving body being formed in the shape of a polyhedron;

a driving means disposed on at least four faces of said driving body polyhedron for suspending said driven body without contact; and

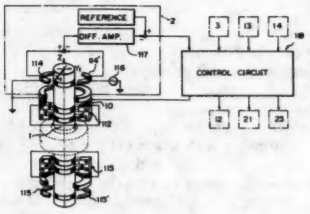
driven body faces at least partially formed by said driven body opposite said driving body faces with said driven body faces having the same shape as said driving body faces, and positioning control means for adjusting a driving force of said driving means and for controlling the positioning of said driven body.

4,885,491

UNSTABLE VIBRATION PREVENTION APPARATUS FOR MAGNETIC BEARING SYSTEM

Hirokuni Hiyama, Tokyo; Katsuhide Watanabe, Kawasaki; Atsushi Nakajima, Koganei, and Chikara Murakami, Hachioji, all of Japan, assignors to National Aerospace Laboratory, Tokyo; Ebara Research Co., Ltd., Fujisawa and Ebara Corporation, Tokyo, all of, Japan

Filed Jun. 14, 1988, Ser. No. 206,464
Claims priority, application Japan, Oct. 28, 1987, 62-270352
Int. Cl.[4] F16C *39/06*
U.S. Cl. 310—90.5 **9 Claims**



1. An unstable vibration prevention apparatus designed for a magnetic bearing system by means of which a rotary body is suspended to rotate about a rotational axis thereof in a non-contact state, comprising:

first displacement detecting means for detecting any displacement in a radial position of said rotary body along a first axis perpendicular to the rotational axis;

first slant angle detecting means for detecting in response to an output of said first displacement detecting means a slant angle of the rotational axis in a direction of the first axis;

first decision means for deciding in response to an output of said first slant angle detecting means whether or not a whirling direction of said rotary body is the same as the rotational direction of said rotary body;

second displacement detecting means for detecting any displacement of the radial position of said rotary body along a second axis which is different from the first axis and is perpendicular to the rotational axis;

second slant angle detecting means for detecting in response to an output of said second displacement detecting means the slant angle of the rotational axis in a direction of the second axis;

second decision means for deciding in response to an output of said second slant angle detecting means whether or not the whirling direction of said rotary body is the same asa that of the rotational direction of the rotary body;

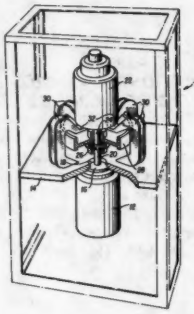
first adding means for adding together an output of said first displacement detecting means and an output of said second decision means; and

second adding means for adding together an output of said second displacement detecting means and an output of said first decision means, thereby supplying outputs of said first and second adding means to said magnetic bearing system to suppress any unstable vibration of said rotary body.

4,885,492
ROTARY POWER MODULE CONSTRUCTION

Robert J. Van Sickle, Richmond, Va., assignor to United Power Corporation, Richmond, Va.

Filed Dec. 14, 1988, Ser. No. 284,358
Int. Cl.[4] H02K 7/18, 7/02, 5/00
U.S. Cl. 310—113 2 Claims



1. A rotary power module especially useful in computer room applications which comprises:

a. a vertically mounted induction motor having a vertically extending output shaft,

b. a vertically synchronous generator positioned above said induction motor with a vertically extending shaft in line with the output shaft of said induction motor,

c. an electrically insulating coupling member directly coupling said shafts of said induction motor and said synchronous generator,

d. a flywheel mounted on said vertically extending shaft of said generator,

e. a plurality of spider-like leg members enveloping said flywheel and for supporting said synchronous generator above said induction motor,

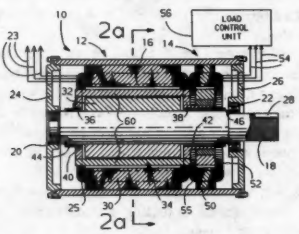
f. and a plate member mounted horizontally between said induction motor and said synchronous generator,

i. said plate member providing a base for securing said spider-like leg members and said plate member being secured to a non-rotating part of said induction motor.

4,885,493
OUTPUT VOLTAGE CONTROL APPARATUS OF A PERMANENT MAGNET ALTERNATOR

Kalyan P. Gokhale, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1988, Ser. No. 223,328
Int. Cl.[4] H02K 21/40
U.S. Cl. 310—190 8 Claims



1. A voltage controlled permanent magnet alternator comprising:

a rotor shaft rotatably supported in a stationary alternator housing;

main machine means including a main permanent magnet rotor pole structure secured to the rotor shaft for rotation therewith, a main stator pole structure secured to said housing radially displaced with respect to said main rotor pole structure, and a main output winding wound therein, said main rotor and stator pole structures being magnetically coupled such that an alternating output voltage in induced in said said main output winding during rotation of said rotor shaft;

flux control means including a plurality of magnetic flux conducting vanes disposed in a radial cavity between said main rotor and stator pole structures;

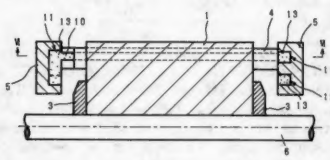
control machine means axially displaced from said main machine means including a control permanent magnet rotor pole structure supported for rotation with said flux control means, a control stator pole structure secured to said housing, and a control output winding wound therein such that rotation of the control permanent magnet pole structure with respect to the control stator pole structure induces a voltage in the control output winding; and

load control means for effecting a variable passive loading of the output winding of said control machine to vary the angular displacement of the flux conducting vanes of said flux control means with respect to said rotor and stator pole structures of said main machine, thereby varying the magnetic coupling therebetween to control the magnitude of the voltage induced in said main output winding.

4,885,494
MOTOR AND MOTOR DEVICE

Kazuhiko Higashi, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 272,332
Claims priority, application Japan, Nov. 27, 1987, 62-300675
Int. Cl.[4] H02K 17/16
U.S. Cl. 310—211 13 Claims



1. A motor being provided with a squirrel cage rotor comprising a plurality of bar conductors short-circuited by two opposite circular conductors at respective both ends thereof,

wherein said squirrel cage rotor has spaces, in which superconductive materials are filled, at each said bar conductor and each said circular conductor,

respective pair of bar conductors being electrically connected to both circular conductors so that the superconductive materials filled in the respective bar conductors and circular conductors may form looped circuits, which are symmetrical relative to a center line of a magnetic pole of said squirrel cage rotor, of a number equal to a number of the magnetic poles.

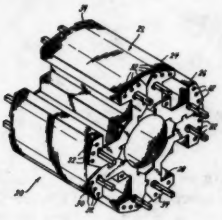
4,885,495
MULTI-PIECE AMORTISSEUR WINDING END PLATE

Hollis D. Sisk, Chesterfield, Mo., assignor to Century Electric, Inc., St. Louis, Mo.

Filed Jul. 18, 1988, Ser. No. 220,739
Int. Cl.[4] H02K 1/00
U.S. Cl. 310—216 10 Claims

1. In an amortisseur winding for a dynamoelectric machine,

said amortisseur winding including a plurality of conductor bars physically connected to and extending between a pair of axially spaced end plates, said end plates being electrically conductive to electrically couple said conductor bars, the improvement comprising an improved end plate construction, at least one of said end plates comprised an assemblage of a plurality of separately formed arcuate segments, said arcuate



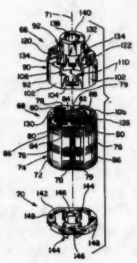
segments being adapted for assembly into a disk-like shape, said segments being characterized by a substantially non-functional portion thereof oriented at least one side thereof as the segments are nested so that their width dimension can be adjusted without substantially affecting performance of said amortisseur winding waste as a plurality of said segments are laid out and formed from a sheet of raw material of predetermined width.

4,885,496

STATOR END MEMBER AND ASSEMBLIES THEREWITH AND METHODS OF ASSEMBLY

Dale K. Wheeler, Fallston, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Jul. 24, 1987, Ser. No. 77,263
Int. Cl.[4] H01R *39/38;* H02K *15/085, 15/10*
U.S. Cl. 310—254 **25 Claims**



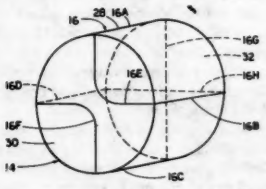
23. A stator subassembly end member, which comprises:
a body;
bridging means formed integrally with the body for supporting a brush box, and
insulating means formed integrally with the body for ultimately providing insulation between a metallic surface of a stator subassembly core and a coil winding upon assembly of the coil winding with the core and the end member.

4,885,497

WINDING FOR A PULSE POWER AC GENERATOR ROTOR

Robert A. Hill, Linthicum Heights, Md., and Dennis J. Scott, Jeannette, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 5, 1988, Ser. No. 228,408
Int. Cl.[4] H02K *1/22*
U.S. Cl. 310—265 **8 Claims**



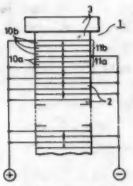
1. A winding for use with a pulse AC generator rotor, comprising:
(a) an electrical conductor extending along a closed loop path;
(b) said conductor including at least four angularly-displaced side conductor portions having first and second opposite ends;
(c) said conductor including at least four end conductor portions interconnecting said four side conductor portions to complete said closed loop path of said conductor;
a first pair of said four end conductor portions being disposed at said first opposite ends of said four side conductor portions and interconnecting respective adjacent pairs of said four side conductor portions;
(e) a second pair of said four end conductor portions being disposed at said second opposite ends of said four side conductor portions and interconnecting respective opposite pairs of said four side conductor portions.

4,885,498

STACKED TYPE PIEZOELECTRIC ACTUATOR

Naomasa Wakita, Aichi, Japan, assignor to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jun. 18, 1986, Ser. No. 875,769
Claims priority, application Japan, Jun. 19, 1985, 60-93187[U]; Aug. 29, 1985, 60-132219[U]
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 **6 Claims**



1. A stacked type piezoelectric actuator comprising:
a stack of electrostrictive strain elements including an end electrostrictive strain element, each of said electrostrictive strain elements of said stack including a first piezoelectric element plate and a second piezoelectric element plate of substantially equal dimensions, one of said first piezoelectric plates and said second piezoelectric plates of said end electrostrictive strain element defining a stack end piezoelectric element plate having a surface forming an en surface of said stack;
means for applying electrical potential to each of said first

piezoelectric element plates and said second piezoelectric element plates of said stack, each of said first piezoelectric element plates being polarized in a first direction of polarization and each of said second piezoelectric element plates being polarized in a second direction of polarization opposite to said first direction of polarization when electric potential is applied to said first and second piezoelectric element plates;

a coupling electrostrictive strain element provided on said end surface of said stack end piezoelectric element plate and comprising two piezoelectric element plates each dimensioned substantially equal to each of said first piezoelectric element plates and mounted one on top of the other, said coupling electrostrictive strain element having a surface forming an end surface of said coupling electrostrictive strain element; and

electrode means connected to said applying means for supplying an electrical potential to polarize said two piezoelectric element plates of said coupling electrostrictive strain element as a single unit in a direction of polarization opposite to the direction of polarization of said stack end piezoelectric element plate.

4,885,499

ULTRASONIC DRIVEN TYPE MOTOR

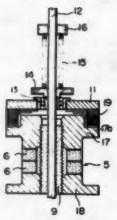
Sadayuki Ueha, Machida; Minoru Kurosawa, Yokohama, and Michiyuki Masuda, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Inc., Japan

Filed Feb. 10, 1989, Ser. No. 308,816

Claims priority, application Japan, Feb. 12, 1988, 63-31427

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—328 5 Claims



1. An ultrasonic driven type motor comprising an ultrasonic torsional vibrator having at least two annular piezoelectric elements for producing torsional vibrations of opposite peripheral direction, a rotor, at least one laminated piezoelectric actuator provided between said vibrator and said rotor for selectivity transmitting a driving force generated from the torsional vibrations of said vibrator to said rotor, and means for applying AC voltages to said ultrasonic torsional vibrator and said laminated piezoelectric actuators to occur a displacement having predetermined phase difference.

4,885,500

QUARTZ QUADRUPOLE FOR MASS FILTER

Stuart Hansen, Palo Alto; John Fjeldsted, Redwood City, and Carolyn Broadbent, Los Altos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 926,056, Nov. 19, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 177,813

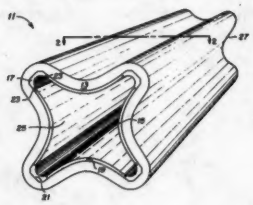
Int. Cl.[4] H01J *1/88*

U.S. Cl. 313—256 3 Claims

1. A quadrupole mass filter electrode assembly comprising:

a glass tube having four elongated concave sections with inner surfaces having generally hyperbolic cross sections, said concave sections being arranged in parallel opposing pairs, and bridge sections with bridging inner surfaces connecting adjacent pairs of concave sections;

parallel conductive strips, each disposed longitudinally upon a respective one of said hyperbolic inner surfaces; and



low-conductivity strips, each disposed upon a respective of said bridging inner surfaces, said low-conductivity strips including metal oxide and a bonding agent for adhering said metal oxide to said respective bridging inner surfaces.

4,885,501

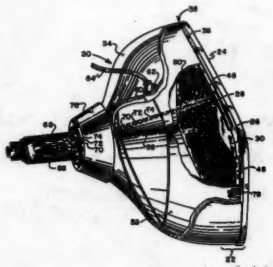
BLACKENING OF NON IRON-BASED FLAT TENSIONED FOIL SHADOW MASKS

Hua Sou Tong, Mundelein, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 127,724, Nov. 30, 1987, abandoned. This application Mar. 29, 1988, Ser. No. 174,660

Int. Cl.[4] H01J *29/07*

U.S. Cl. 313—402 13 Claims



1. For use in a color cathode ray tube having a flat faceplate, a shallow mask comprising:

a non iron-based apertured foil; and

a think oxidized layer of metal disposed on said foil to increase its emissivity.

4,885,502

DEFLECTION UNIT FOR USE IN A PROJECTION TELEVISION DISPLAY TUBE

Albertus A. S. Sluyterman, and Nicolaas G. Vink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1988, Ser. No. 162,521

Claims priority, application Netherlands, Mar. 24, 1987, 8700684

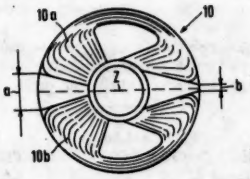
Int. Cl.[4] H01J *29/70*

U.S. Cl. 313—431 5 Claims

1. An electromagnetic deflection unit for use in a projection television display tube having a display end with a display screen facing an electron gun at an opposed gun end, comprising:

a system of line deflection coils for deflecting the electron

beam in the display tube in the horizontal direction, which system comprises two oppositely located saddle coils each having longitudinal conductor groups which are to be positioned on either side of the longitudinal axis of the display tube, characterized in that at the screen end the conductor groups of the oppositely located saddle coils on one side of the tube axis are located at a first distance from each other and on the other side are located at a second, smaller distance from each other, and in that at the gun end the conductor groups of the oppositely located saddle



coils on said one side of the tube axis are located at a third distance from each other and on said other side are located at fourth distance from each other which is larger than said third distance, the distances at the screen end being adjusted to generate a 4-pole component upon energisation of the system of line deflection coils, which component renders the raster to be written on the display screen tapezoidal, and the distances at the gun end being adjusted to generate a 4-pole component which is opposite to the 4-pole component generated in the proximity of the screen end.

4,885,503

COLOR CATHODE-RAY TUBE

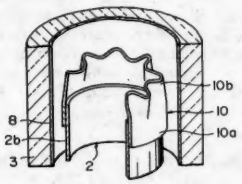
Eiki Takahashi, Hitachi; Masahiro Miyazaki, Mobara, and Kiyoshi Nakamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 272,065

Claims priority, application Japan, Nov. 18, 1987, 62-289430; Aug. 31, 1988, 63-214986

Int. Cl.[4] H01J *29/48, 29/06*

U.S. Cl. 313—450 **24 Claims**



1. A cathode-ray tube comprising a neck glass tube having an inner peripheral surface coated with an electroconductive layer, an electron gun including a shield cup having an outer peripheral surface radially inwardly spaced from said electroconductive layer and cooperating therewith to define therebetween a gap, and a particle shielding element extending between said shield cup and said electroconductive layer to close said gap to thereby guard said electron gun against invasion of particles, said particle shielding element having a radially outer portion disposed in contact with said electroconductive layer, at least a part of said particle shielding element being formed from a shape memory metal, said particle shielding element having been deformed to an outer diameter smaller than an inner diameter of said electroconductive layer before said particle shielding element is installed in position in said neck glass tube, to thereby allow said particle shielding element to be inserted into said neck glass tube without scratching said electroconductive layer.

4,885,504

HOLLOW CATHODE ASSEMBLY AND LAMP

James G. Green, Pakenham Upper, Australia, assignor to Photron Pty. Ltd., Victoria, Australia

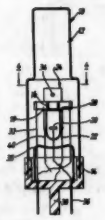
PCT No. PCT/AU86/00325, § 371 Date Jul. 28, 1987, § 102(e) Date Jul. 28, 1987, PCT Pub. No. WO87/03422, PCT Pub. Date Jun. 4, 1987

PCT Filed Oct. 29, 1986, Ser. No. 96,884

Claims priority, application Australia, Nov. 28, 1985, PH3629

Int. Cl.[4] H01J *61/09*

U.S. Cl. 313—618 **6 Claims**



1. A boosted discharge hollow cathode assembly comprising a hollow cathode, open at spaced apart ends, formed of a selected element which characterizes the assembly;

means supporting the hollow cathode;

an anode spaced from one of said open ends of the cathode;

electron emission means having an electron emission outlet spaced from the other open end of the cathode; and

means to constrain an electron stream from said emission outlet to the anode to pass through the cathode;

wherein said cathode support means is not insulated to prevent surface discharge therefrom but in operation of the assembly within a lamp envelope, by application of a sufficient voltage between the cathode and anode to generate a discharge for causing cathodic sputtering of said selected element, the electron stream from the electron emission means through the cathode to the anode substantially confines surface discharge to the interior of the cathode, and

wherein said constraining means comprises an inner transparent envelope which is disposed about said anode and has an open end in close proximity to said one open end of the cathode.

4,885,505

ELECTRON GUN ASSEMBLY

Shinpei Koshigoe, Fukaya, and Takeshi Fujiwara, Kumagaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 939,888, Dec. 9, 1986, abandoned. This application Aug. 22, 1988, Ser. No. 235,719

Claims priority, application Japan, Dec. 9, 1985, 60-274958

Int. Cl.[4] H01J *29/48*

U.S. Cl. 315—3 **4 Claims**

1. An electron gun assembly comprising:

a cathode means for emitting three electron beams;

a focusing electrode disposed adjacent to said cathode means for focusing the three beams;

an intermediate electrode disposed adjacent to said focusing electrode;

an accelerating electrode for accelerating the electron beams disposed adjacent to said intermediate electrode;

a resistor having first and second ends and an intermediate

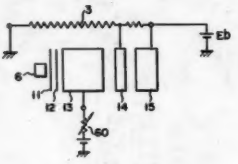
terminal point there between, the second end being connected to the accelerating electrode and the intermediate terminal point being connected to the intermediate electrode;

means for supporting the cathode means, said electrode arrangement and resistor;

means for receiving the cathode means, said electrode arrangement and the resistor;

first and second stem pins fixed to said receiving means, the first end of said register being connected to ground via the first stem pin and the second stem pin being connected to the focusing electrode;

means, connected to the second end of said resistor, for applying a first voltage to said resistor through the second



end of said resistor to maintain the accelerating and intermediate electrode at accelerating and intermediate potentials, respectively, thereby forming static electricity lenses between the accelerating and intermediate electrodes to accelerate and converge the three electron beams at a predetermined point; and

means, connected to the second stem pin, for applying a second voltage to the focusing electrode to maintain the focusing electrode at a focusing potential, thereby forming static electricity lenses between the focusing electrode and the intermediate electrode to focus the three electron beams, respectively, said convergence of said three electron beams being unchanged in response to said second voltage being applied to said focusing electrode.

4,885,506

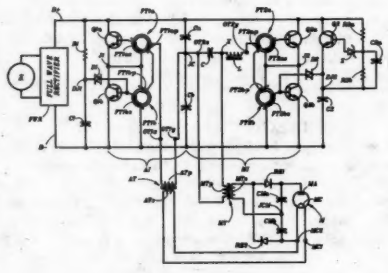
ELECTRONIC MAGNETRON POWER SUPPLY

Ole K. Nilsen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Dec. 6, 1984, Ser. No. 679,139

Int. Cl.[4] H05B *41/14*

U.S. Cl. 315—102 **15 Claims**



10. An electronic circuit arrangement comprising

rectifier means connected with an ordinary electric utility power line and operable to provide periodic DC voltage pulses at a DC output;

inverter means connected with said DC output and operative, but only if being supplied with an actuating signal, to provide periodic intermittent bursts of squarewave voltage at a squarewave output, the frequency of this squarewave voltage being substantially higher than the frequency of the voltage on said power line;

an L-C circuit resonant at or near the frequency of the squarewave voltage and effectively series-connected across the squarewave output, said L-C circuit representing a potentially destructive short circuit to said output except if provided with an effective load;

magnetron load means connected with said L-C circuit and operable to constitute said effective load, but only after having been supplied for a period of time with conditioning power by way of a set of conditioning terminals;

conditioning means connected with these conditioning terminals and operable to provide said conditioning power; and

actuating means operable to supply said actuating signal, but only after said conditioning means has been providing said conditioning power for at least said period of time.

4,885,507

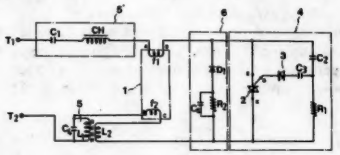
ELECTRONIC STARTER COMBINED WITH THE L-C BALLAST OF A FLUORESCENT LAMP

Byung I. Ham, 1524 King Ham Way, Fullerton, Calif. 92633

Continuation of Ser. No. 76,314, Jul. 21, 1987. This application Dec. 2, 1988, Ser. No. 279,328

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—244 **1 Claim**



1. An electronic starter for use with an L-C ballast of a fluorescent lamp including a switching circuit having a triac, a diac and a capacitor, said switching circuit being connected in parallel with said fluorescent lamp, wherein said capacitor is for preventing undesired actuation of the switching circuit between said diac and said capacitor, said starter further comprising: a resonance circuit having a choke coil and a first capacitor, said resonance circuit being connected in series with a first terminal of said fluorescent lamp; a voltage multiplying rectifier circuit having a resistance and a diode and a capacitor connected in parallel with said resistance, said voltage multiplying rectifier circuit being connected in parallel with said fluorescent lamp and being connected in parallel with said switching circuit through a transformer, said transformer being connected to a second terminal of said fluorescent lamp.

4,885,508

SYSTEM FOR CONTROLLING THE INTENSITY OF HIGH POWER LIGHTS

William G. Krokaugger, Chatsworth, Calif., assignor to Mole-Richardson Company, Hollywood, Calif.

Continuation of Ser. No. 925,322, Oct. 31, 1986, abandoned. This application May 5, 1988, Ser. No. 203,517

Int. Cl.[4] H05B *41/16, 41/24*

U.S. Cl. 315—287 **3 Claims**

3. A system for controlling the intensity of a gas vapor arc globe comprising:

a source of DC power,

low frequency oscillator means comprising an astable multivibrator for generating a low frequency square wave;

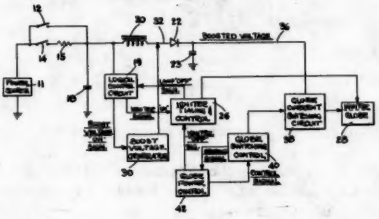
first switching circuit means connected to said source of DC power and said low frequency oscillator means an responsive to the square wave output of said low frequency oscillator means for alternately feeding current through said globe in opposite directions,

high frequency pulse width modulator means for generating a rectangular wave having a duty cycle and width at a high audio frequency,

the rectangular wave output of said pulse width modulator means being fed to said switching circuit means to pulse width modulate the square wave envelope output of said low frequency oscillator means in a series of pulses at said high audio frequency,

means for controlling the duty cycle and width of the rectangular wave of said high frequency oscillator means thereby controlling the current fed to said globe and the intensity thereof,

means for boosting the voltage of said source of DC power to provide a boosted voltage to said globe comprising an oscillator operating at a high audio frequency, and inductor connected in the current path of said first switching circuit means, and second switching circuit means responsive to the output of said oscillator and connected in a current path with said inductor, said second switching means effecting periodic surges of current through said inductor at said high audio frequency thereby generating said boosted voltage,



a current limiting resistor in series with the current path of said first switching circuit means,

logical control circuit means for bypassing said limiting resistor in response to a signal indicating that a predetermined operating voltage has been established,

an ignitor circuit for igniting the globe, and

means for deactivating said ignitor circuit once the globe has been ignite and deactivating the source of DC power should the globe fail to ignite after a predetermined period of time comprising current sensing means for sensing that current is being fed to said globe and third switching circuit means responsive to said current sensing means for disabling the ignitor circuit.

4,885,509

HIGH VOLTAGE GENERATING APPARATUS FOR SUPPLYING HIGH VOLTAGE TO CATHODE RAY TUBE

Hiroshi Ikeuchi, Yokosuka, Japan, assignor to Murata Manufacturing Company, Nagaokakyo, Japan

Filed Apr. 29, 1988, Ser. No. 188,578

Claims priority, application Japan, Apr. 30, 1987, 62-107288; Jul. 9, 1987, 62-171863; Nov. 11, 1987, 62-285056

Int. Cl.[4] H01J *29/70*; H04N *5/63, 5/68*

U.S. Cl. 315—411 **14 Claims**

1. A high voltage generating apparatus provided between a horizontal output circuit, which operates with a signal from a horizontal drive circuit, and a cathode-ray tube, said high voltage generating apparatus to supply a high voltage to an anode of said cathode-ray tube, said high voltage generating apparatus comprising:

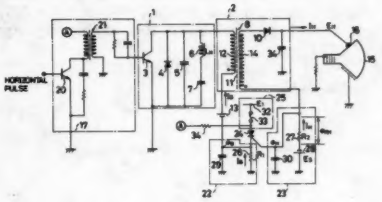
a flyback transformer having a low voltage coil and a high voltage coil, said flyback transformer boosting a flyback pulse generated in said horizontal output circuit;

a rectifier circuit rectifying a high voltage produced in said high voltage coil to supply the rectified high voltage to the anode of said cathode-ray tube;

a primary side current detection circuit detecting a primary current flowing in said low voltage coil;

a secondary side current detection circuit detecting a high voltage current flowing in said high voltage coil;

a circuit means which operates when a quantity of current detected by said primary side current detection circuit



becomes large in reference to a quantity of current detected by said secondary side current detection circuit; and

a shut-off means for shutting off a power to be supplied to at least one of said horizontal drive circuit and said horizontal output circuit to stop the operation of said horizontal output circuit when said circuit means operates.

4,885,510

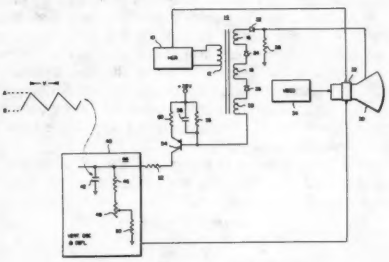
BEAM CURRENT COMPENSATED VERTICAL SIZE CONTROL

Lloyd E. Matthews, Berwyn, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 8, 1988, Ser. No. 230,225

Int. Cl.[4] H01J *29/70*

U.S. Cl. 315—411 **1 Claim**



1. A deflection system comprising:

a cathode ray tube;

a high voltage transformer including high voltage tripler windings for supplying high voltage to said cathode ray tube;

a vertical oscillator and deflection means for supplying a vertical deflection signal to said cathode ray tube and including a timing capacitor and a shunt connected vertical size control resistance for determining the discharge current of said timing capacitor;

a sensing resistor connected in series with said high voltage tripler windings; and

a PNP compensating transistor having a base-emitter input circuit including said sensing resistor and a collector-emitter output circuit coupled across said vertical size control resistance for adjusting said discharge current as a function of the current in said sensing resistor.

4,885,511

DRIVE CONTROL WITH OVERLOAD PROTECTION FOR A DRILL DEVICE

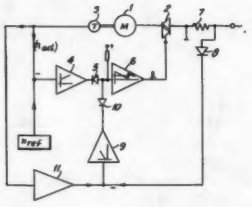
Wolfgang Millauer, Munich, Fed. Rep. of Germany; Gottfried Benz, Schaan, Switzerland; Heinrich Pauli, Germering, and Franz Hoyss, Wackersberg, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 37,179, Apr. 10, 1987, abandoned. This application Aug. 26, 1988, Ser. No. 237,699

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, 3612193

Int. Cl.[4] H02P 7/62

U.S. Cl. 318—434 2 Claims



1. A drive control for a drilling device with a series wound universal motor, comprising means for effecting current limitation to said motor when a load limit moment (M limit) is reached, wherein the improvement comprises:

a circuit containing said motor (1), said circuit is connected to a supply voltage;

an rpm regulator (4) located in the circuit for comparing an actual rpm value (N act) of said motor with a constant reference rpm value (N ref), said regulator (4) having an output voltage;

means in said circuit and responsive to said regulator output voltage for maintaining the actual rpm value corresponding to the constant reference rpm value;

said means for maintaining comprises a first decoupler diode (5) and a second decoupler diode (10), said first and second decoupler diodes (5, 10) having a junction point, wherein said rpm regulator (4) reaches maximum output voltage at a fraction point (Mn) of the load limit moment (M limit), and wherein the voltage at the junction point of said decoupler diodes remains constant during an increase in torque from the fraction point (Mn) to the load limit moment (M limit); and

a current regulator (9) in said circuit for reducing the voltage at said junction point only when the load limit moment (M limit) is reached.

4,885,512

WIPER CIRCUIT SYSTEM FOR MOTOR VEHICLES

Günther Gillé, Sersheim, and Horst Goertler, Sachsenheim, both of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

PCT No. PCT/EP87/00725, § 371 Date Aug. 18, 1988, § 102(e) Date Aug. 18, 1988, PCT Pub. No. WO88/04623, PCT Pub. Date Jun. 30, 1988

PCT Filed Nov. 24, 1987, Ser. No. 249,923

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643414

Int. Cl.[4] B60S 1/08

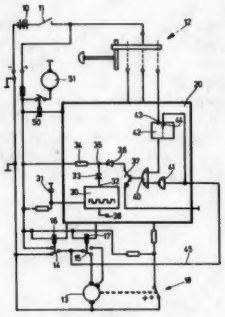
U.S. Cl. 318—444 4 Claims

1. A wiper circuit system for driving a windshield wiper of an automotive vehicle having a vehicle battery, said system comprising, in combination

an electric motor adapted to be mechanically coupled to a windshield wiper and being controlled by an operating switch for different modes of operation;

an oscillator circuit having an input coupled to said operating switch and having an output for applying variable frequency operating potential control signals to said motor;

means responsive to the voltage of said vehicle battery for varying the frequency of said oscillator circuit as a function of the vehicle battery voltage when said operating



switch selects a continuous operation mode of operation of said motor; and

means for maintaining the frequency of said oscillator circuit to a constant value when said operating switch selects an intermittent operation mode of operation of said motor.

4,885,513

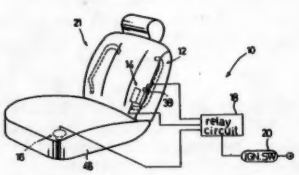
SIDE SUPPORT DEVICE FOR A VEHICLE SEAT

Takao Sakamoto, and Kiyotaka Takizawa, both of Akishiam, Japan, assignors to Tachi-S Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,712

Int. Cl.[4] A47C 7/46; B60N 1/06

U.S. Cl. 318—468 6 Claims



1. A side support device for use with a seat in a vehicle comprising:

a side support disposed in the seat and adapted to be in an opened position or a closed position;

a motor for driving said side support into the open and closed positions;

an inclination sensing switch for detecting the inclination of the seat;

relay circuit means connected between said inclination sensing switch and said motor, and

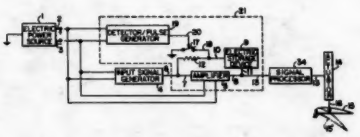
wherein said relay circuit means changes the rotation of said motor forwardly or reversely responsive to said inclination sensing switch to thereby move said side support into the opened or closed position.

4,885,514

ARRANGEMENT FOR CONTROLLING THE POSITION OF AN AIRCRAFT CONTROL SURFACE

Ari M. Novis, Rocky Hill; Don L. Adams, Fairfield; Troy J. LaMontagne, Wallingford, and Albert Sivahop, Trumbull, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 24, 1987, Ser. No. 138,618
Int. Cl.[4] G05D 3/12
U.S. Cl. 318—580 **14 Claims**



1. An arrangement for controlling the position of an aircraft control surface member, comprising:

means for supplying electric power;

means for issuing an electric input signal having a value that is indicative of the desired position of the control surface member at least while electric power is being supplied by said supplying means;

means for amplifying said input signal, including an input terminal receiving said input signal and an output terminal carrying an output signal;

means connected to said output terminal and operative for positioning the control surface member in dependence on said output signal;

means for storing electric charge, including one terminal connected to said input terminal of said amplifying means and another terminal connected to said output terminal, said storing means being discharged upon interruption of the supply of electric power by said supplying means and recharged with a predetermined time constant upon restoration of such supply;

means for detecting the restoration of the supply of electric power by said supplying means and issuing a switching signal for a predetermined time interval immediately following such restoration; and

means for recharging said storing means to said correct value immediately after the restoration with a time constant amounting at most to a small fraction of said predetermined time constant, including means for grounding said one terminal of said storing means in response to and for the duration of said switching signal.

4,885,515

VELOCITY CONTROL APPARATUS

Mitsuo Kurakake, Hino, and Keiji Sakamoto, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

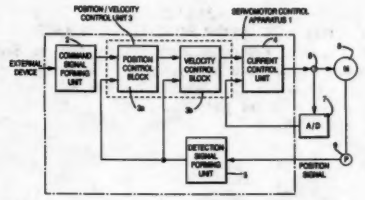
PCT No. PCT/JP87/00966, § 371 Date Jul. 28, 1988, § 102(e) Date Jul. 28, 1988, PCT Pub. No. WO88/04493, PCT Pub. Date Jun. 16, 1988
PCT Filed Dec. 11, 1987, Ser. No. 231,851
Claims priority, application Japan, Dec. 12, 1986, 61-296386
Int. Cl.[4] G05B 19/28
U.S. Cl. 318—567 **6 Claims**

1. A velocity control apparatus forming discrete velocity information by receiving and processing a pulse signal fed back from a servomotor for controlling the velocity of the servomotor, comprising:

velocity control arithmetic means, connected to the servomotor, for generating a velocity control signal to control the servomotor;

sampling means for receiving and sampling the pulse signal at a sampling period corresponding to a processing period of said velocity information; received and sampled pulses occurring in a length of time which is equivalent to the processing period divided by an integer;

memory means for storing plural items of count data corresponding to the received and sampled pulses counted during the sampling period by said counting means, the count data being stored by said memory means while



being successively updated with a most recent count data; and

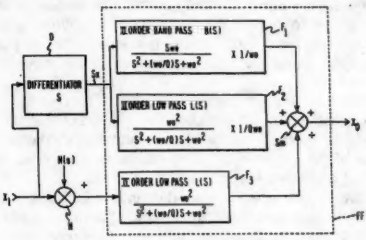
arithmetic means for adding a predetermined number of the count data from said memory means and supplying a result of the addition as velocity information to said velocity control arithmetic means.

4,885,516

TECHNIQUES FOR DISK SERVO TRACK FOLLOWING

Ashraf I. El-Sadi, San Jose, Calif., assignor to Unisys Corporation, Detroit, Mich.

Continuation of Ser. No. 808,706, Dec. 13, 1985, abandoned, which is a continuation of Ser. No. 560,715, Dec. 12, 1983, Pat. No. 4,577,244. This application Mar. 11, 1988, Ser. No. 167,230
Int. Cl.[4] G05B 5/01
U.S. Cl. 318—615 **4 Claims**



1. An arrangement SS for controlling automatic high speed positioning motor means associated with a track-following servo in a disk drive for a high-density disk file, for determining relatively noise-free head-position-error signals (X_o), said arrangement SS being characterized by position-error signals with significant undesirable related noise components, including resonance and other "mechanical" noise plus "electrical" noise, this control arrangement SS comprising:

a time-variant signal input means I adapted to accept time-variant position-error signals, t-S, including noise components thereof;

filter means FF coupled to receive the output of said input means I and comprising a second order low pass filter stage, also including circuit means adapted to automatically process the prescribed noise-including position-error signals t-S along with motor-current signals m-s, said second order low pass filter stage operating at a prescribed center-frequency range to implement a prescribed transfer function; said filter means FF also being adapted

to apply the time variant position-error signals, t-S being time-differentiated, to other second order filter means; and

summing means SM adapted to receive the output of the filter means, whereby to derive a low-noise representation of said time-variant position-error signals t-S without excessive attenuation thereof.

4,885,517

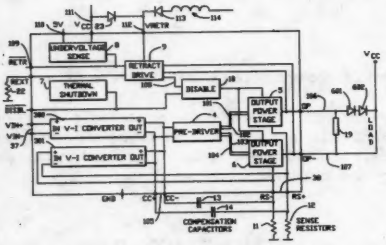
VOICE COIL ACTUATOR POSITIONING AMPLIFIER

John L. Pennock, Edinburgh, Scotland, assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jun. 20, 1988, Ser. No. 208,894

Int. Cl.[4] G05F *1/00*

U.S. Cl. 318—678 **16 Claims**



1. A signal amplifier for driving a load connected across the arms of a bridge network, the amplifier comprising:

an output stage having a first port electrically coupled to one arm of the bridge network, and a second port electrically coupled to the other arm of the bridge network, each of the ports being capable of existing in a conductive and a non-conductive mode;

a comparator stage electrically coupled to receive an input signal and to control the first port of the output stage in response to the polarity of the input signal, the first port of the output stage being conductive when the input signal amplitude is zero;

a modulating stage electrically coupled to receive the input signal and to control the second port of the output stage in response to the polarity of the input signal, the second port of the output stage being conductive when the input signal amplitude is zero; and

said comparator stage and modulating stage being further responsive to said input signal when the input signal amplitude deviates from zero, so that the appropriate one of the ports of the output stage becomes conductive and the other port becomes non-conductive depending on the input signal's polarity.

4,885,518

INDUCTION MOTOR TORQUE/FLUX CONTROL SYSTEM

Colin D. Schauder, Murrysville Boro., Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 21, 1987, Ser. No. 87,939

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—798 **4 Claims**

1. In an AC induction motor drive including:

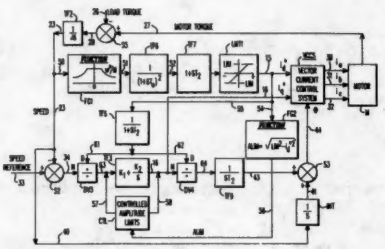
first means responsive to a flux demand for generating a first signal representative of a direct component reference current;

second means responsive to a torque demand for generating a second signal representative of a quadrature component reference current;

third means responsive to a speed signal for generating a third signal representative of a position angle characterizing the current resultant vector of said direct and quadrature components; and

fourth means responsive to said first, second and third signals for generating three coordinate phase currents for the motor drive; the combination of

means within said first means for dynamically responding to said flux demand and first limiting means respopnsive to said dynamically responding means for limiting said first



signal in magnitude within a predetermined maximum value LIM;

second limiting means responsive to said first limiting means for establishing with said first signal a limit ALIM defined by the square of said first signal being made equal to (LIM^2-$ALIM^2$); said second limiting means being operative upon said second means for limiting said second signal so that said resultant vector remain within the limit ALIM.

4,885,519

METHOD AND APPARATUS FOR DETERMINING THE FLUX VECTOR OF A ROTATING-FIELD MACHINE

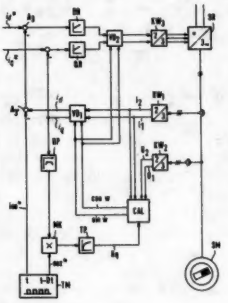
Heinrich-Karl Vogelmann, Eppingen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 4, 1988, Ser. No. 141,406

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1987, 3700524

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—800 **11 Claims**



1. A method for determining a flux vector of a rotating field machine having a stator current vector impressed by a frequency changer comprising:

(a) calculating a model flux vector by:

(i) forming an EMF vector from the stator current vector and the stator voltage, said EMF vector having a resultant direction;

(ii) vectorially adding a correction vector to said EMF

vector to change said direction of said EMF vector to form a resulting sum vector; and

(iii) integrating the resulting sum vector to form a model flux vector;

(b) impressing an oscillating component of a given oscillation frequency on a component of said stator current vector that is parallel to said calculated model flux vector;

(c) determining a harmonic having an oscillation frequency associated with a component of said stator current vector that is perpendicular to said calculated flux vector; and

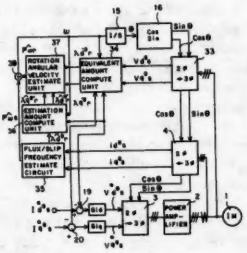
(d) changing a component of said correction vector that is perpendicular to the model flux vector as a function of said determined harmonic until the amplitude of said determined harmonic becomes a minimum.

4,885,520

INDUCTION MOTOR CONTROLLER

Hidehiko Sugimoto, and Shinzo Tamai, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,508
Claims priority, application Japan, Aug. 8, 1987, 62-198570
Int. Cl.[4] H02P 5/40
U.S. Cl. 318—808 **4 Claims**



1. An induction motor controller comprising:

a power supply unit connected to an input of a three phase induction motor for supplying a controlled alternating current power to said induction motor;

a first coordinate converter for converting a three phase excitation current of said motor into two orthogonal excitation current components;

a flux/slip frequency estimate circuit coupled to said first coordinate converter for developing a slip frequency estimation value and a secondary interlinkage flux value based on said orthogonal excitation current components;

an estimation amount compute unit for developing an estimated value of secondary interlinkage flux based on said secondary interlinkage flux value from said flux/slip frequency estimate circuit and at least one of said two orthogonal excitation current components;

a second coordinate converter for converting a three phase voltage of said induction motor into two orthogonal voltage components;

an equivalent amount compute unit for developing a secondary interlinkage flux equivalent amount based on said orthogonal voltage components and said orthogonal excitation current components;

a rotation angular velocity estimate unit for developing an estimated amount of the rotation angular velocity of said induction motor based on said estimated value of secondary interlinkage flux and said secondary interlinkage flux equivalent amount;

an adder for adding said estimated amount of rotation angular velocity and said slip frequency estimation value to obtain a primary angular frequency of said induction motor; and

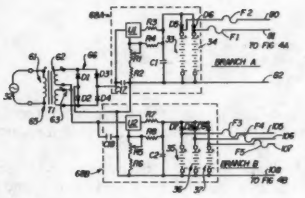
means for controlling the alternating current power supplied by said power supply unit based upon said primary angular frequency.

4,885,521

UNIQUE COMPUTER POWER SYSTEM WITH BACKUP POWER

Timothy P. Crampton, Marietta, Ga., assignor to Applied Research & Technology, Inc., Atlanta, Ga.

Continuation of Ser. No. 927,657, Nov. 5, 1986, abandoned, which is a continuation-in-part of Ser. No. 769,358, Aug. 26, 1985. This application Dec. 15, 1987, Ser. No. 132,995
Int. Cl.[4] H02J 7/00, 9/00
U.S. Cl. 320—14 **9 Claims**



1. In combination,

a computer device comprising, at least, a microprocessor and a DC power bus;

first power means for providing DC power to said computer device, said first power means comprising, at least, first AC/DC converter means for converting AC power input to DC power output at a first voltage;

power connect means for communicating said DC power output of said first power means to said DC bus of said computer device;

second power means for providing DC power to said computer device, said second power means comprising at least one DC battery for providing a DC output, first current pass means for controlling the flow of current from said battery to said computer, and first regulating means for regulating operation of said current pass means, whereby a target voltage output is provided from said second power source, and

second power connect means for communicating said DC output of said second power means directly to said DC bus of said computer device;

battery charging means for providing charging voltage to said DC battery of said second power means;

whereby the computer device is powered by DC power from said first power means so long as said first voltage is maintained higher than said target voltage, and is powered by DC power from said second power means when said first voltage drops below said target voltage.

4,885,522

CONSTANT CURRENT SOURCE AND BATTERY CHARGER

John G. Konopka, Barrington, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 127,745, Dec. 2, 1987, Pat. No. 4,829,259. This application Nov. 16, 1988, Ser. No. 272,142
Int. Cl.[4] H02J 7/10
U.S. Cl. 320—21 **3 Claims**

1. A battery charger operated from a single-ended power supply comprising:

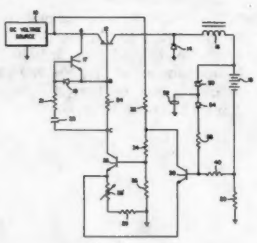
pulse width modulation means including a transistor power

switch, a diode and an inductor for supplying current to a battery;

means for monitoring current flow to said battery;

trigger means for controlling the frequency and duty cycle of said pulse width modulation means responsive to said monitoring means;

a speed up circuit for said switch transistor comprising a shorting transistor coupled across the base-emitter circuit



of said switch transistor and means responsive to said trigger means for driving said shorting transistor conductive;

current foldback means including zener diode sensing means for monitoring the voltage of said battery; and means for changing said monitoring means to substantially reduce current flow to said battery when a battery voltage corresponding to a fully charged state is reached.

4,885,523

BATTERY CONDITIONING SYSTEM HAVING COMMUNICATION WITH BATTERY PARAMETER MEMORY MEANS IN CONJUNCTION WITH BATTERY CONDITIONING

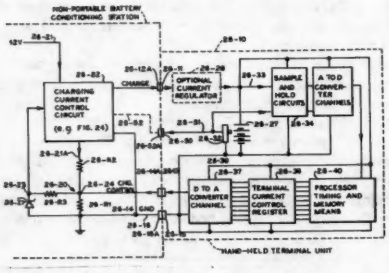
Steven E. Koenck, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Mar. 15, 1988, Ser. No. 168,352

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.[4] H02J *7/00*

U.S. Cl. 320—21 **48 Claims**


NON-PORTABLE BATTERY CONDITIONING STATION
CHARGING CURRENT CONTROL CIRCUIT
OPTIONAL CURRENT REGULATOR
SAMPLE AND HOLD CIRCUITS
A TO D CONVERTER CHANNELS
D TO A CONVERTER CHANNEL
TERMINAL CURRENT CONTROL REGISTER
PROCESSOR TIMING AND MEMORY MEANS
HAND-HELD TERMINAL UNIT

1. In a battery conditioning system,

rechargeable battery means for supplying operating current during a number of hours of portable operation so as to become progressively discharged as a result,

memory and communications means for operative association with the rechargeable battery means and receiving power from the rechargeable battery means during portable operation, and

battery conditioning system means for coupling with said rechargeable battery means and with said memory and communications means, for conditioning of the battery means after a period of portable operation and for the transmission of data concerning said rechargeable battery means.

4,885,524

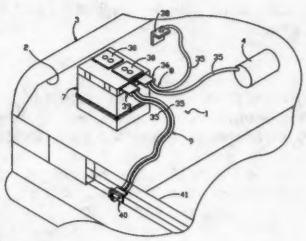
VEHICLE BATTERY SYSTEM

William M. Wilburn, Wheelersburg, Ohio, assignor to William J. Goldcamp, Portsmouth, Ohio

Filed Apr. 15, 1988, Ser. No. 182,305

Int. Cl.[4] H01M *10/44;* **H02M** *2/30*

U.S. Cl. 320—25 **13 Claims**



1. A battery system of the type mounted in a vehicle for providing electric current to a starter of the vehicle and for providing and receiving electric current to and from a remote battery, said battery system including:

(a) a battery having a casing;

(b) a pair of spaced electrodes incorporated in said casing;

(c) a first electrical cable having a universal plug attached to one end thereof, with an opposite end of the first electrical cable being adapted for electrical connection to the starter and a ground of the vehicle;

(d) a second electrical cable having a universal plug attached to each end thereof, with a selected one of the universal plugs of the second electrical cable being mounted on a grille of the vehicle and further being accessible without opening an engine compartment hood of the vehicle;

(e) a pair of universal plugs embedded in the battery casing, with the universal plug of the first electrical cable being engageable with a selected one of the universal plugs of the battery in a single orientation for electrically connecting the battery to the starter, and with the other of the universal plugs of the second electrical cable being engageable with the other of the universal plugs of the battery in a single orientation for electrically connecting the second electrical cable and the battery; and

(f) electrical circuit means embedded in the casing for electrically connecting each of the electrodes to a respective one of the universal plugs of the battery.

4,885,525

VOLTAGE CONTROLLABLE CURRENT SOURCE

Walter S. Gontowski, Jr., Thompson, Conn., assignor to Cherry Semiconductor Corporation, East Greenwich, R.I.

Filed Apr. 26, 1989, Ser. No. 343,844

Int. Cl.[4] G05F *3/16*

U.S. Cl. 323—315 **8 Claims**

1. A current source proportionally responsive to a control voltage comprising:

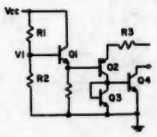
a first bipolar transistor of a first conductivity type;

means for providing a stable voltage to the base of said transistor thereby to provide at the emitter of said transistor an intermediate voltage which differs from said stable voltage by one base-emitter drop;

a second bipolar transistor of conductivity type complementary to said first conductivity type, the base of said second transistor being connected to the emitter of said first tran-

sistor thereby to establish at the emitter of said second transistor an input voltage which is essentially equal to said stable voltage, the emitter of said second transistor being connected to said control voltage through a resistor whereby the current applied to that emitter is proportional to the difference between said stable voltage and said control voltage;

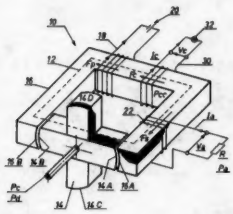
a current mirror, the collector of said second transistor being connected to the input of said current mirror, whereby the output current of said current mirror is essentially a linear function of said control voltage.



4,885,526
COMPENSATION CIRCUIT FOR ELECTRICAL GENERATORS

Leslie I. Szabo, Budapest, Hungary, assignor to Electro Erg Limited, Budapest, Hungary

Filed Mar. 23, 1988, Ser. No. 172,274
Int. Cl.[4] H02K 1/10; H02P 9/10
U.S. Cl. 322—66 **18 Claims**



1. An alternating-current,electricity generator comprising:

a magnetic flux path;

a first conductor surrounding a portin of the magnetic flux path for generating electric current in the first conductor when magnetic flux varies in the magnetic flux path, wherein the generated current in the first conductor induces a magnetic flux in the magnetic flux path;

a second conductor surrounding a portion of the magnetic flux path for inducing, when an electric current flows in the second conductor, a compensating magnetic flux which opposes the magnetic flux induced by the generated current in the first conductor;

means for supplying to the second conductor a compensating current for inducing the compensating magnetic flux, the compensating current having a reactive component;

wherein the means for supplying the compensating current is

a second alternating-current, electricity generator having:

a second magnetic flux path; and

a third conductor surrounding a portion of the second magnetic flux path for generating electric current in the third conductor when magnetic flux varies in the second magnetic flux path; and

wherein the third conductor is electrically connected to the second conductor so that electric current generated in the third conductor is supplied to the second conductor.

11. In an alternating-current, electricity generator having a magnetic flux path and a first conductor surrounding a portion of the magnetic flux pathfor generating electric current having ohmic component in the first conductor when magnetic flux varies in the magnetic flux path, wherein the generated current in the first conductor induces a magnetic flux in the magnetic flux path, a compensation circuit comprising:

a second conductor surrounding a portion of the magnetic flux path for inducing, when an electric current flows in the second conductor, a compensating magnetic flux which opposes the magnetic flux induced by the generated current in the first conductor; and

means for supplying to the second conductor a compensating current for inducing the compensating magnetic flux, the compensating current having a reactive component;

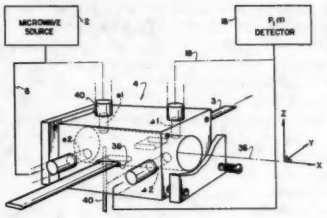
wherein electric power having a reactive component and a real component is generated in the first conductor of the generator,

wherein the means for supplying the compensating current includes means for supplying to the second conductor electric power having a reactive component and a real component less than or equal to the real component of power generated in the first conductor.

4,885,527
DEVICE FOR CONTINUOUSLY MEASURING THE RATE AT WHICH FIBERS CONDUCTING OR NOT CONDUCTING ELECTRICITY ARE IMPREGNATED BY A SUBSTANCE

Jean F. Lacombe, Saint Medard En Jalles, and Jean L. Miane, Talence, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jul. 28, 1988, Ser. No. 225,541
Claims priority, application France, Aug. 4, 1987, 87 11059
Int. Cl.[4] G01N 22/04
U.S. Cl. 324—58.5 C **9 Claims**



1. Device for the continuous measurement of the impregnation rate by any substance of fiber (3), having a microwave source (2), a resonant cavity (4) adapted to be coupled to the microwave source via a first waveguide (6), the cavity having an axis of symmetry (36) parallel to a first direction (x) and a passage (38) for the fiber, traversing the cavity in its centre and oriented parallel to a second direction (6) perpendicular to the first direction, a detector (16) of the microwave power (P1(t)) transmitted by the cavity (4) and adapted to be coupled to the cavity via a second waveguide (18) and transforming said power into an electric signal, means (20, 22, 24, 26, 28) for processing the electric signal in order to deduce therefrom the impregnation rate and means (32) for displaying the impregnation rate, characterized in that the cavity (4) has a circular section excited in accordance with a resonant mode TE_{11n}, with n being an uneven number exceeding 1, said cavity having (a) a first input (e1) and a first output (s1) for microwaves, oriented parallel to a third direction (z) perpendicular to the first and second directions (x,y), said first input and output (e1, s1) being respectively connected to the first (16) and second (18) guides when the fiber (3) is conductive, so that the first component (E1) of the electric field of the resonant mode TE_{11n}, oriented in the third direction (z) is perpendicular to the conductive fiber (3), (b) a second input (e2) and a second

output (x2) for microwaves, oriented parallel to the second direction (y), said second input and output being respectively connected to the first (16) and second (18) guides when the fiber (3) is non-conductive, so that the second component (E2) of the electric field of the resonant mode TE_{11n}, oriented in the second direction (x) is parallel to the non-conductive fiber and (c) a mode filter (40) for eliminating from the resonant cavity (4) said first component (E1) of the electric field when the fiber (3) is non-conductive.

4,885,528

APPARATUS WHICH USES A SIMULATED INDUCTOR IN THE MEASUREMENT OF AN ELECTRICAL PARAMETER OF A DEVICE UNDER TEST

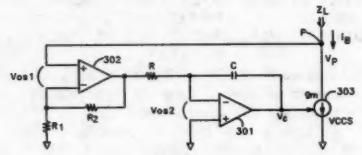
Hideshi Tanaka; Kazuyuki Yagi; Shigeru Tanimoto; Yasuaki Komatsu; Koichi Yanagawa, and Yoichi Kuboyama, all of Hachioji, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 3, 1989, Ser. No. 318,286

Claims priority, application Japan, Mar. 4, 1988, 63-29322[U]

Int. Cl.[4] G06G *7/62*; G01R *27/00*

U.S. Cl. 324—57 R **4 Claims**



1. An apparatus for measuring the AC electrical parameters of a circuit device under test, comprising:

an AC signal source means for applying an AC signal coupled to one terminal of said device under test;

a DC bias source means for applying a DC bias coupled to the one terminal of a device to be tested, the DC bias source means including

a transistor,

an operational amplifier whose non-inverting input, inverting input and output are coupled to a reference voltage source, an emitter and a base of said transistor, respectively,

first resistor coupled to said emitter,

serial circuit including second resistor and capacitor being coupled to a collector of said transistor, and

an inductor coupled between a load and said collector;

an AC voltage measurement means coupled for measuring the AC voltage across the device under test;

a simulated inductor means coupled to another terminal of the device under test; and

an AC current measurement means coupled for measuring the AC current through the device under test.

4,885,529

IDENTIFICATION OF FLUIDS AND AN INTERFACE BETWEEN FLUIDS BY MEASURING COMPLEX IMPEDANCE

David O. Lee, 6409 Quemado N.E., Albuquerque, N. Mex. 87109, and James R. Wayland, Jr., 500 Oakwood Pl. N.E., Albuquerque, N. Mex. 87123

Filed Mar. 10, 1988, Ser. No. 166,343

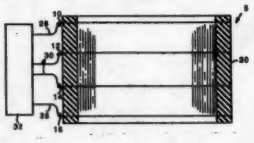
Int. Cl.[4] G01R *27/00*

U.S. Cl. 324—57 R **4 Claims**

1. A method for identifying an interface between two different fluids comprising:

measuring, at a plurality of different frequencies over a predetermined frequency range, the complex impedance between spaced electrodes immersed in a fluid;

calculating a function of the difference between the maximum complex impedance and the minimum complex impedance measured over said frequency range for a plurality of different fluid levels; and



using the fluid level of a discontinuity in said function as an indication of the location of an interface between different fluids.

4,885,530

DEVICE FOR EARLY DETECTION OF BREAKS AND MARGINAL WEAR IN THE CUTTING EDGES OF TOOLS

Kurt Mayer, Essen; Volker Richey, Dortmund, and Hans-Peter Schneider, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Fried Krupp, GmbH, Essen, Fed. Rep. of Germany

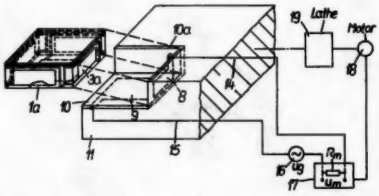
Continuation-in-part of Ser. No. 915,126, Oct. 3, 1986, Pat. No. 4,744,241. This application Nov. 20, 1987, Ser. No. 123,257

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1986, 3639917

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[4] G01N *3/58, 3/56, 27/02*; B23Q *17/09*

U.S. Cl. 324—61 R **10 Claims**



1. A tool in a machine tool used in a machining process, comprising:

a cutting plate having a cutting edge and having insulated conductor means defining an insulated conductor path embedded in said cutting edge; and

means for applying an alternating voltage to said path without physical contact therewith, whereby a break in or marginal wear to said cutting edge is detectable as a change in impedance in said path.

4,885,531

CONTINUOUS DETERMINATION AND CONTROL OF THE WEIGHT OF HAY BALES DURING THE BALING PROCESS

Dennis E. Stowell, P.O. Box 796, Parowan, Utah 84761

Continuation-in-part of Ser. No. 13,130, Feb. 10, 1987, Pat. No. 4,812,741. This application Mar. 13, 1989, Ser. No. 322,353

Int. Cl.[4] G01N *5/02*

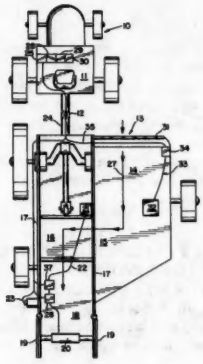
U.S. Cl. 324—65 P **8 Claims**

1. A bale weight control system for a conventional baling machine having a driver's compartment and a compression zone defined by opposed parallel flat retaining walls capable of being urged together by hydraulic force means, said control system comprising:

(a) a moisture sensing system which continuously monitors the moisture content of hay passing through said compression zone, and produces an output electrical signal related to the moisture content of the hay being baled,

(b) a hydraulic pressure sensing system which continuously monitors the hydraulic pressure of said hydraulic force means, and produces an output electrical signal related to said pressure,

(c) a battery-operated microprocessor adapted to combine the signals from said moisture sensing system and hydraulic pressure sensing system to produce a third output electrical signal related to the weight of a bale being produced at a given point in time, said microprocessor using a definite relationship between moisture content of the hay and hydraulic pressure to determine the bale weight, said relationship being determined by calibration of the system for a given baler, and dependent upon the type of crop being baled,



(d) electrically controlled valve means responsive to said third signal for adjusting hydraulic pressure and thereby maintaining a constant weight of the bales being produced,

(e) gauge means activated by said output electrical signals, for providing a continuous indication of the weight of bales being produced as well as instantaneous readings of hay moisture content and hydraulic pressure,

(f) means for applying controlled quantities of water to the hay,

(g) electrically controlled valve means responsive to the output signal of the moisture sensing system to adjust the quantity of water applied to the bale in cases where the hay being baled is too dry, and

(h) electrical conductors which interconnect the moisture sensing system, the hydraulic pressure sensing system, both valve means, the microprocessor and the gauge means.

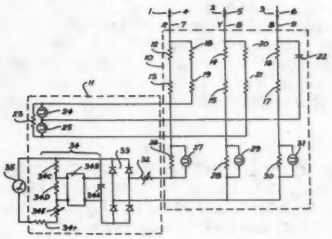
4,885,532

APPARATUS FOR TESTING MULTIPHASE OUTLET WITH VISUAL INDICATION OF PHASE ENERGIZATION, PHASE ROTATION, AND SUPPLY VOLTAGE

Laurence D. Macey, Warners Bay, Australia, assignor to Macey Mining Services Pty. Ltd., Warners Bay, Australia

Filed Aug. 24, 1988, Ser. No. 235,413
Claims priority, application Australia, Aug. 24, 1987, PI3935
Int. Cl.[4] G01R *19/14*
U.S. Cl. 324—133 **5 Claims**

1. Electrical testing apparatus for testing a multiphase alternating current supply outlet, said apparatus comprising a voltage dropping impedance network for each phase, and a corresponding phase energization indicator connected to each said voltage dropping impedance network, said networks and indicators being located within a housing with said indicators being visible from the exterior of said housing, and said housing having a socket connection for each phase compatible with said supply outlet and connected to the corresponding voltage droping network, and wherein said supply has three phases, a first and second phase rotation indicator are connected to-



gether in series with each other and between two of said voltage dropping impedance networks, a substantially resistive impedance is connected in parallel with said phase rotation indicators, and a phase shifting impedance is connected between the remaining voltage dropping impedance network or its corresponding socket connection, and the interconnection of said phase rotation indicators.

4,885,533

ELECTRICAL CIRCUIT TEST PROBE HAVING AN ELONGATE CYLINDRICAL RETAINING AND SLIDING BEARING REGION

Thomas D. Coe, Boxford, Mass., assignor to Q A Technology Company, Inc., Hampton, N.H.

Filed Sep. 9, 1988, Ser. No. 242,786
Int. Cl.[4] G01N *31/02*; G01R *31/02*
U.S. Cl. 324—158 P **4 Claims**

3. A probe for providing electrical contact to electrical circuits during the testing thereof comprising:

(a) a tubular housing having an open end and a generally closed end, said housing comprising a main portion extending from said generally closed end towards said open end and an elongate retaining and sliding bearing portion defining said open end and having a diameter smaller than said main portion;

(b) a probe plunger disposed in said tubular housing, said plunger comprising a cylindrical inner portion being a slide fit and disposed within said main portion of said tubular housing and a cylindrical outer portion of a diameter smaller than said inner portion and forming a shoulder with said inner portion at a point of meeting, said outer portion of said plunger passing through said retaining and sliding bearing portion and having an outside diameter which is a slide fit to the inside diameter of said retaining and sliding bearing portion; and,

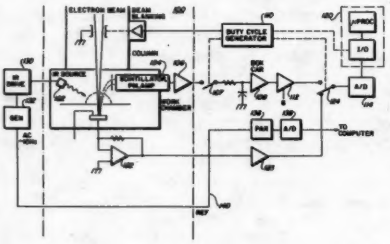
(c) a longitudinally compressible bias spring disposed between said generally closed end of said end tubular housing and said inner portion of said probe plunger under a pre-loading for biasing said probe plunger towards an extended position.

4,885,534

DIRECT MEASUREMENT OF PHOTODIODE IMPEDANCE USING ELECTRON BEAM PROBING

Robert E. Eck, Goleta, and Richard J. Joyce, Thousand Oaks, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Sep. 14, 1988, Ser. No. 244,217
Int. Cl.[4] G01R *31/28, 31/26*
U.S. Cl. 324—158 D **17 Claims**



1. Photodiode testing apparatus comprising:

electron-beam source means for generating a beam of primary electrons;

beam control means for directing the beam to a selected diode in a photodiode array;

infrared source means for applying a selected level of infrared flux to said photodiode;

means responsive to a selected alternating signal for varying the infrared flux level at a predetermined frequency and amplitude; and

means for measuring the ac voltage at the photodiode produced by said variation of infrared flux level;

wherein the impedance of the photodiode is directly determined from said measurements of alternating voltage and alternating infrared flux level.

4,885,535

MAGNETIC TILT SENSOR WITH PERMANENT MAGNET SURROUNDING MAGNETIC SENSING ELEMENT

Yoshimoto Odagawa, and Yasushi Yanagisawa, both of Chiba, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jun. 20, 1988, Ser. No. 209,064
Claims priority, application Japan, Jun. 22, 1987, 62-153337
The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.
Int. Cl.[4] G01B *7/14*
U.S. Cl. 324—207 **6 Claims**

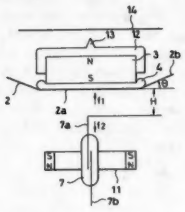
1. A magnetic tilt sensor comprising:

a non-magnetic case having a hollow portion and a bottom surface with a tilt center;

first permanent magnet means housed in said case;

magnetic fluid means, adhered to at least a portion of said first permanent magnet means, for slidably supporting said first permanent magnet means on said bottom surface;

magnetic sensing element means for sensing magnetism of said first permanent magnet means, said magnetic sensing element means being fixed at a position outside of the case adjacent said bottom surface; and



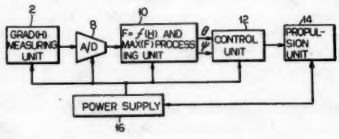
second permanent magnet means for cancelling magnetic fluxes of the first permanent magnet means when said first permanent magnet means is supported on said bottom surface and is aligned with said tilt center, said second permanent magnet means surrounding said magnetic sensing element means and having polarity directions opposite to those of said first permanent magnet means.

4,885,536

MAGNETIC PROCESS FOR DETERMINING A TRAJECTORY FOR FINDING A MAGNETIC OBJECT AND APPARATUS FOR PERFORMING THE PROCESS

Roland Blanpain, St Laurent du Pont; Patrick Le Masson, Villard de Lans, and Jean-Charles Vidal, Meylan, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 22, 1988, Ser. No. 147,139
Claims priority, application France, Jan. 30, 1987, 87 01129
Int. Cl.[4] G01B *7/14*; G01R *33/02*
U.S. Cl. 324—207 **3 Claims**



1. Apparatus for determining a trajectory for finding a magnetic object, the apparatus comprising:

measuring means for measuring at least three independent components of the gradient of a parameter at least dependent upon a magnetic field ambient at a point at least partly from a magnetic object;

determining means for determining and storing a scalar criterion which is a function of the measuring components of the gradient;

calculating means for calculating from the determined and stored criterion the direction (θ,ψ) maximizing the criterion; and

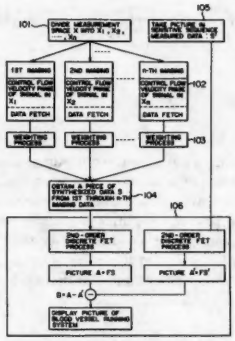
display means for displaying the direction, whereby the direction is a trajectory for moving a vehicle toward the object,

wherein the measuring means comprises four total field magnetometers, one of the magnetometers being placed in the centre of a trihedron linked with the apparatus and the three other magnetometers are each disposed on one of the axes of said trihedron, each magnetometer measuring the modulus of the magnetic field in which it is placed.

4,885,537
METHOD OF NUCLEAR MAGNETIC RESONANCE IMAGING AND APPARATUS FOR THE SAME

Kazuo Suzuki, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 304,477
Claims priority, application Japan, Feb. 5, 1988, 63-25215
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 16 Claims



1. A method of nuclear magnetic resonance imaging comprising the steps of:

(a) setting, to a predetermined target phase value, the difference between the phase of a resonance signal originating from a part of a body under test which part has a flow velocity and the phase of a resonance signal which would originate from said same part on assumption that said same part is quiescent;

(b) dividing a measurement space, that is a time band in which said resonance signal is generated, into a plurality of partial regions;

(c) setting a particular measurement time point in each of said divided partial region;

(d) obtaining such a gradient magnetic field that said phase difference is equal to said predetermined value at said particular measurement time point;

(e) successively measuring said resonance signal over the entirety of said measurement space under the application of said gradient magnetic field;

(f) measuring said resonance signal, by following said steps (c), (d) and (e), for all of said partial regions; and

(g) extracting data of said part having flow velocity from said measured resonance signal.

4,885,538
LOW DATA RATE LOW NOISE SERIAL DIGITAL COMMUNICATION LINK FOR MAGNETIC RESONANCE IMAGING SYSTEMS

John C. Hoenniger, III, Oakland, and Kenneth E. Hosier, Jr., Pittsburgh, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 235,362, Aug. 19, 1988, abandoned. This application Dec. 29, 1988, Ser. No. 291,956
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—312 18 Claims

1. A nuclear magnetic resonance imaging system comprising:

RF and magnetic coil means for exciting a body to be imaged;

means for sensing the nuclear magnetic resonance response from said excited body;

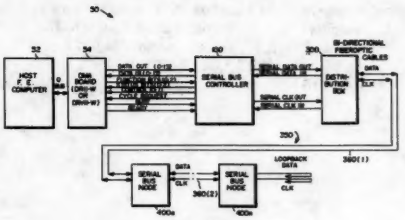
data acquisition computer means, connected to said sensing means, for developing an image of said body in response to said sensed nuclear magnetic resonance response;

peripheral means, operatively coupled to said coil means and/or said sensing means, for affecting the operation thereof;

control computer means for controlling said peripheral means; and

digital communications means for communicating digital signals between said peripheral means and said control computer means, said communications means including:

a controller including a first input shift register and a first output shift register, said peripheral means including a further input shift register and a further output shift register,



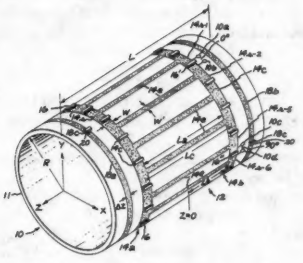
communications link means connected between said controller and said peripheral means for connecting said first and further input shift registers together in series to provide an input shift register distributed between said controller and said peripheral means, and for connecting said first and further output shift registers together in series to provide an output shift register distributed between said controller and said peripheral means, and

clock loop means for applying shift pulses to said distributed input shift register causing data to flow from said further to said first input shift register and for applying said same shift pulses to said distributed output shift register causing data to flow from said first to said further output shift register.

4,885,539
VOLUME NMR COIL FOR OPTIMUM SIGNAL-TO-NOISE RATIO

Peter B. Roemer, Schenectady; Paul A. Bottomley, Clifton Park, and William A. Edelstein, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 6, 1988, Ser. No. 202,624
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 20 Claims



1. A radio-frequency (RF) volume coil, for at least one of

excitation and reception of NMR response signals from a sample having an effective radius r_s, comprising:

a tube of an insulative material and having exterior surface; and

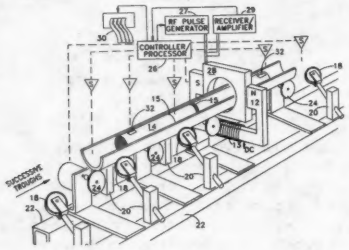
a conductive, generally cylindrical RF antenna fabricated upon said exterior surface with a radius r_c which is between about $1.0r_s$ and about $1.6r_s$ and an effective length L_c of less than $2r_s$, and having a signal-to-noise ratio (SNR), when said sample is enclosed within said antenna, greater than the SNR of a similar RF antenna having the same radius r_c and an effective length of at least $4r_s$.

4,885,540

AUTOMATED NUCLEAR MAGNETIC RESONANCE ANALYSIS

Michael L. Snoddy, and Houston B. Mount, II, both of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 31, 1988, Ser. No. 264,927
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **16 Claims**



1. Apparatus for oil and gas exploration ny nuclear magnetic resonance (NMR) analyses of sections of core comprising:

NMR analysis means for NMR analysis of a portion of core positioned in a probe zone thereof, the NMR means having an inlet side and an outlet side;

beltless drive means for engaging the drive engaging portion of a core trough comprising a receptacle portion for receiving a section of core and a drive engaging portion for engaging drive means and for supporting the core trough and for positioning portions of a core supported in the core trough in the target zone of NMR analysis means and for causing successive troughs supporting core sequentially to enter the inlet side of NMR means and after NMR analysis to exit the outlet side; and

controller means for causing the drive means to position successive portions of supported core in the target zone and for causing NMR analysis means to generate a measure of NMR response of such positioned successive portions of core and for causing successive troughs supporting core to sequentially enter the inlet side of NMR analysis means and to exit the outlet side.

4,885,541

APPARATUS AND METHOD FOR ENHANCED MULTIPLE COIL NUCLEAR MAGNETIC RESONANCE (NMR) IMAGING

Cecil E. Hayes, Wauwatosa, Wis., assignor to General Electric Company, Milwaukee, Wis.

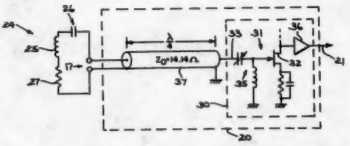
Filed Aug. 19, 1988, Ser. No. 234,360
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **7 Claims**

1. A nuclear magnetic resonance (NMR) signal acquisition apparatus comprising:

a first coil having a source impedence R_s;

a first preamplifier having an optimum source impedance R_{opt} and an input impedence R_{in}, with R_{in} being less than R_{opt}; and

first matching means for connecting the first coil to the first preamplifier such that the source impedance of the first coil R_s is transformed by the matching means to be approximately equal to the optimum source impedance R_{opt} at the first coil R_s is transformed by the matching means to



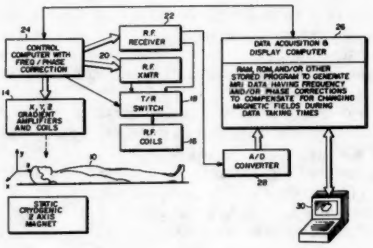
be approximately equal to the optimum source impedance R_{opt} at the point of connection between the first matching means and the first preamplifier and the low input impedance of the first preamplifier is transformed by the first matching means to be a value higher than the optimum source impedance R_{opt} at the point of connection between the first matching means and the first coil.

4,885,542

MRI COMPENSATED FOR SPURIOUS NMR FREQUENCY/PHASE SHIFTS CAUSED BY SPURIOUS CHANGES IN MAGNETIC FIELDS DURING NMR DATA MEASUREMENT PROCESSES

Ching Yao, Belmont; James D. Hale, Berkeley; Lawrence E. Crooks, Richmond, and Leon Kaufman, San Francisco, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 14, 1988, Ser. No. 181,440
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—313 **36 Claims**


CONTROL COMPUTER WITH FREQ / PHASE CORRECTION
R.F. RECEIVER
R.F. XMTR
T/R SWITCH
R.F. COILS
X, Y, Z GRADIENT AMPLIFIERS AND COILS
DATA ACQUISITION & DISPLAY COMPUTER
RAM, ROM, AND/OR OTHER STORED PROGRAM TO GENERATE MRI DATA HAVING FREQUENCY AND/OR PHASE CORRECTIONS TO COMPENSATE FOR CHANGING MAGNETIC FIELDS DURING DATA TAKING TIMES
A/D CONVERTER
STATIC CRYOGENIC Z AXIS MAGNET

1. In a magnetic resonance imaging method which gathers NMR image data over a sequence of measurement cycles during which first magnetic gradient pulses are superimposed on a nominally static magnetic field to selectively address NMR RF excitations for at least one predetermined volume and second magnetic gradient pulses are superimposed on said static field at other times in a measurement cycle, the improvement comprising:

performing at least one further of said measurement cycles during which at least one of said second gradient pulses is omitted so as to produce calibration data representative of the magnetic field then existing in said predetermined volume; and

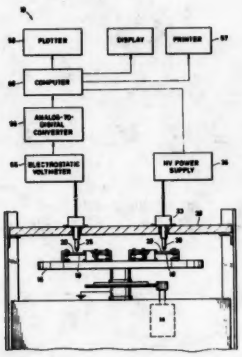
using said calibration data to produce MRI data compensated for errors which otherwise would be present due to undesirable changes with respect to time in the magnetic field actually present in said predetermined volume.

4,885,543

ELECTROSTATIC DISCHARGE TEST APPARATUS

William C. Smith, Las Cruces, N. Mex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 16, 1988, Ser. No. 156,393
Int. Cl.[4] G01N 27/60
U.S. Cl. 324—452 12 Claims



1. Apparatus for measuring the electrostatic discharge behavior of a plurality of test samples, comprising:

(a) co-available first and second electrostatic charging means, said first charging means being a corona charging means and said second charging means being a triboelectric charging means,

(b) means supporting said electrostatic charging means for sequentially exposing such a plurality of test samples to a selected one of said electrostatic charging means, and

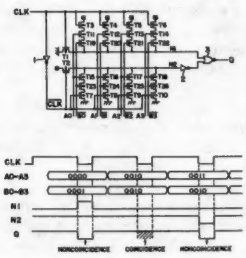
(c) measuring means for individually measuring the amount of electrostatic charge on the samples and for monitoring the decay of such charge to determine the individual electrostatic discharge behavior of the samples.

4,885,544

DETERMINATION CIRCUIT FOR DATA COINCIDENCE

Nobuo Tago, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 28, 1988, Ser. No. 291,269
Claims priority, application Japan, Dec. 28, 1987, 62-335737
Int. Cl.[4] H03K 3/013, 5/24, 17/687, 19/096
U.S. Cl. 328—110 2 Claims



1. A coincidence determination circuit comprising:

a first comparison unit provided with a plurality of first bit comparison units corresponding to a plurality of bits, each bit comparison unit comprising a first P-channel transistor having a gate to which a clock signal is inputted, a second P-channel transistor having a gate to which reference data of a certain bit is inputted, and a third P-channel transistor having a gate to which inverted data of the data of that bit to be compared is inputted, said first to third P-channel transistors being connected in series, respective outputs of said first bit comparison units being wired-OR connected to a first output line, said first output line serving to pull its signal level down in response to said clock signal;

a second comparison unit provided with a plurality of second bit comparison units corresponding to a plurality of bits, each bit comparison unit comprising a first N-channel transistor having a gate to which an inverted signal of said clock signal is inputted, a second N-channel transistor having a gate to which reference data of a certain bit is inputted, and a third N-channel transistor having a gate to which inverted data of the data of that bit to be compared is inputted, said first to third N-channel transistors being connected in series, respective outputs of said second bit comparison units being wired-OR connected to a second output line, said second output line serving to pull its level up by said inverted signal of said clock signal; and

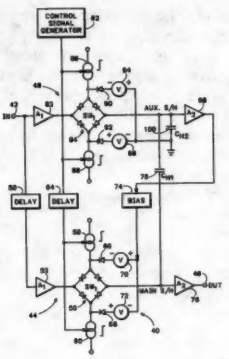
an output unit for producing a coincidence output when said first output line is at a low level and said second output line is at a high level.

4,885,545

HIGH SPEED CIRCUIT WITH SUPPORTING AUXILIARY CIRCUIT

Sergio A. Sanielevici, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 8, 1988, Ser. No. 229,195
Int. Cl.[4] G11C 27/02; H03K 5/159
U.S. Cl. 328—151 13 Claims



1. A circuit for processing a time-varying signal comprising:

an input terminal;

an output terminal;

a main subcircuit coupled between said input and output terminals for conducting the time-varying signal along a first path from said input terminal, through said main subcircuit to said output terminal;

an auxiliary subcircuit substantially identical to at least a portion of said main subcircuit and coupled between said input terminal and said main subcircuit for conducting the time-varying signal along a second path from said input terminal, through at least a portion of said auxiliary subcircuit to said main subcircuit;

delay means for delaying the time of propagation of the time-varying signal along one of said first and second paths so that the time-varying signal at a selected point

along said first path has a predetermined time relationship with respect to the time-varying signal traveling along said second path at the point it is fed to said main subcircuit; and

supplemental subcircuit means coupled between said auxiliary subcircuit and said main subcircuit and forming art of said second path for further processing the signal along said second path, said delay means compensating for any propagation delay of the signal passing through said supplemental subcircuit means.

4,885,546

DIGITAL DEMODULATOR FOR AM OR FM

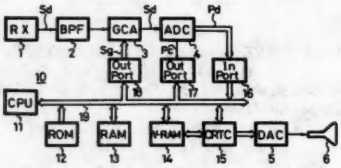
Shoji Araki, Kanagawa, Japan, assignor to Sony Corp., Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,180

Claims priority, application Japan, Feb. 10, 1988, 63-29125; May 27, 1988, 63-129933

Int. Cl.[4] H03D *1/02, 3/00*

U.S. Cl. 329—341 **16 Claims**



1. A demodulating circuit for demodulating an AM- or FM-modulated signal, comprising:

analog-to-digital converter means receiving said modulated signal for providing analog-to-digital converted values at a plurality of sampling points in a cycle of said modulated signal;

means for integrating said converted values so as to provide a calculated integration value therefrom for the respective cycle;

means for dividing said calculated integration value by a maximal integration value which is similarly provided; and

means for deriving a quotient of said dividing as a demodulated output corresponding to said respective cycle of the modulated signal.

4,885,547

GAIN CELL WITH DIGITAL CONTROL

Marshall J. Bell, Jr., Camas, Wash., and Daniel S. Draper, Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 7, 1988, Ser. No. 215,964

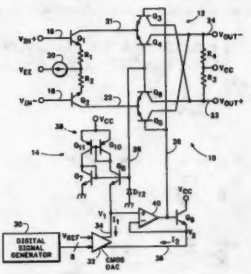
Int. Cl.[4] H03G *3/30*

U.S. Cl. 330—254 **14 Claims**

1. A controller for a Gilbert multiplier circuit responsive to first and second control signals for generating first and second output signals, respectively; said controller comprising:

means for generating a digital signal representative of a desired relationship between the first and second output signals; and

means coupled to the Gilbert multiplier circuit for converting the digital signal into the first and second control signals such that the desired relationship between the first



and second output signals results from applying the control signals to the Gilbert multiplier circuit.

4,885,548

WIDEBAND AMPLIFIER

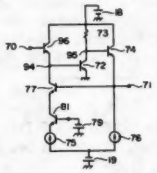
Tsutomu Wakimoto, Atsugi, and Yukio Akazawa, Isehara, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,937

Claims priority, application Japan, Jul. 24, 1987, 62-183624

Int. Cl.[4] H03F *1/14, 3/45*

U.S. Cl. 330—260 **9 Claims**



6. A wideband amplifier comprising:

amplifying means comprising at least one transistor having an input node and an output node; at least one input terminal; means coupling said at least one input terminal to the input node; an output terminal; and means coupling said output terminal to the output node, to effect a voltage variation at the input node and the output node in response to a voltage variation at said at least one input terminal;

wherein said at least one transistor has input capacitance and output capacitance and current flow in the input and output capacitance in response to a voltage applied to the input node;

means for detecting variations in voltage at one of the input node and the output node of said at least one transistor;

means including a transistor junction capacitance directly coupled to said detecting means for producing a compensation current of equal magnitude and opposite direction to current flowing in the input capacitance of said at least one transistor; and

means for applying the compensation current to the input node of said at least one transistor.

4,885,549

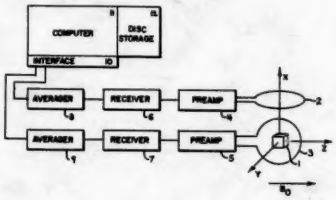
METHOD OF PHASE AND AMPLITUDE CORRECTION OF NMR SIGNALS USING A REFERENCE MARKER

Robert L. Thrift, Livermore, Calif., and Paul K. Morris, Gloucester, Canada, assignors to General Electric Company, New York, N.Y.

Filed Nov. 30, 1988, Ser. No. 278,121

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—307 **5 Claims**



1. A method of correcting phase and amplitude error between first and second complex NMR signals A(t) and B(t) comprising the steps of:

identifying a first reference frequency component present in both NMR signals;

band pass filtering the first and second complex NMR signals where the center frequency of the band pass filter is substantially the same as that of the reference frequency component, to produce corresponding first and second complex filtered signals G(t) and H(t);

calculating a correction function J(t) by dividing the first complex filtered signal G(t) by the second complex filtered signal H(t);

applying the complex correction function J(t) to the second complex NMR signal B(t) to produce a corrected second complex NMR signal B'(t) in which the phase and amplitude are adjusted.

4,885,550

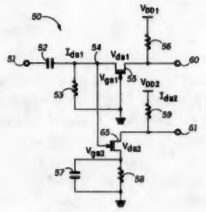
SIGNAL INPUT TO DIFFERENTIAL OUTPUT AMPLIFIER

Enrique Ferrer, Miami, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 1, 1988, Ser. No. 278,381

Int. Cl.[4] H03F *3/68, 3/16*

U.S. Cl. 330—301 **8 Claims**



1. A single input, differential output amplifier having reduced phase error, comprising:

an inverting stage for driving an independent load including an input port, an output port, and an inverting transistor,

a non-inverting stage for driving another independent load, including an input port, an output port, and a non-inverting transistor,

said input port of said inverting stage being coupled to said input port of said non-inverting stage for simultaneously receiving an input signal.

4,885,551

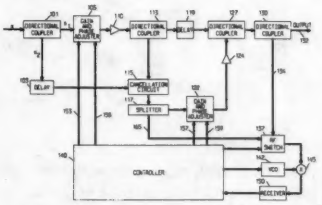
FEED FORWARD LINEAR AMPLIFIER

Robert E. Myer, Denville, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 31, 1988, Ser. No. 265,084

Int. Cl.[4] H03F *1/32*

U.S. Cl. 330—52 **20 Claims**



1. A feed forward circuit comprising:

means for receiving one or more modulated carrier signals in a prescribed frequency range;

a first circuit path having an input connected to the receiving means and an output, the first circuit path including power amplifying means responsive to the one or more modulated carrier signals for generating an output signal having a distortion component;

a second circuit path having an input connected to the receiving means and an output, the second circuit path including delay means for transferring the one or more modulated carrier signals without distortion;

means for combining the power amplifying means output signal from the output of the first circuit path with the transferred one or more modulated carrier signals from the output of the second circuit path to form a signal representative of the distortion component of the first circuit path output signal; and

means for subtracting the signal from the combining means from the output signal of the first circuit path to reduce the distortion component of the output signal of the first path;

wherein the improvement comprises

means for detecting one of the carrier signals from the combining means within the prescribed frequency range; and

means responsive to the detected carrier signal for modifying the amplitude and phase of signals in the first circuit path to reduce the magnitude of the detected carrier signal in the distortion component representative signal.

4,885,552

OSCILLATOR PHASE CONTROL LOOP HAVING PLURAL SWITCHED CURRENT SOURCES

Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1988, Ser. No. 253,784

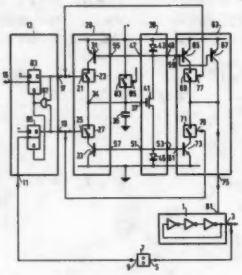
Claims priority, application Netherlands, Oct. 12, 1987, 8702424

Int. Cl.[4] H03L *7/08, 7/18*

U.S. Cl. 331—1 A **2 Claims**

1. An oscillator circuit comprising a phase control loop including a phase detector which has a first input coupled to an output of an oscillator, a second input coupled to a comparison signal input of the control loop, and an output circuit coupled to a current-source circuit which is switchable by means of said output circuit for controlling the charge of a capacitor from which a control signal for the oscillator is obtained,

characterized in that the capacitor is connected to an input of a voltage-current converter with the aid of which a control current is obtained as a control signal for the oscillator, the



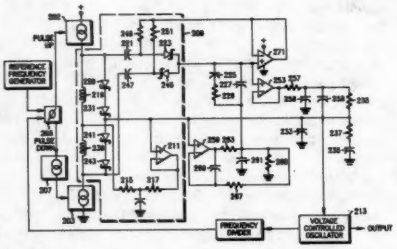
frequency of the oscillator being dependent on said control current, and the control current being obtained via a second current-source circuit which is also switchable by means of the phase detector.

4,885,553

CONTINUOUSLY ADAPTIVE PHASE LOCKED LOOP SYNTHESIZER

Alexander W. Hietala, Schaumburg, and Steven F. Gillig, Roselle, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 30, 1988, Ser. No. 278,052
Int. Cl.[4] H03L *7/10, 7/18*
U.S. Cl. 331—17 **3 Claims**



1. A continuously adaptive phase locked loop synthesizer having a voltage oscillator and a frequency reference each coupled to a phase detector which generates control pulses having pulse widths ranging from wide to narrow, and a loop filter on the control line input of the voltage controlled oscillator to generate the control line voltage, comprising:

means, coupled to the phase detector, for coupling wide pulse width control pulses to the loop filter at a first rate of charge transfer;

means, coupled to the phase detector, for coupling narrow pulse width control pulses to the loop filter at a second rate of charge transfer; and

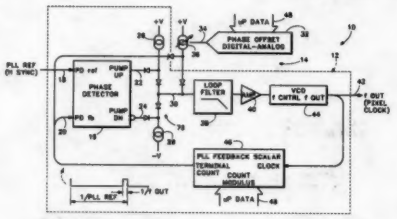
means, coupled to the loop filter, for generating a reference signal substantially equal to the control line voltage and for coupling said reference signal to said means for coupling narrow pulse width control pulses, whereby said narrow pulse width control pulses are not directly coupled to the control line input of the voltage controlled oscillator.

4,885,554

PHASE-OFFSET SIGNAL GENERATOR

Guenther W. Wimmer, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 16, 1988, Ser. No. 285,260
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—25 **16 Claims**



1. A device for generating an output signal having a predetermined phase offset relative to a periodic reference signal, said device comprising:

phase locked loop (PLL) means responsive to the reference signal and to an offset signal representative of the predetermined phase offset from within a predetermined range of phase offsets, for generating an output signal having the predetermined phase offset from the reference signal; and

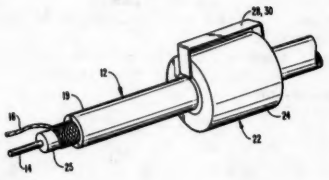
phase offset means coupled to said PLL means for generating the offset signal representative of the predetermined phase offset, as a single pulse occurring once each period of the reference signal.

4,885,555

INTERCONNECTION FOR HIGH FIDELITY SIGNALS

Donald E. Palmer, 1275 Vicente #189, Sunnyvale, Calif. 94086

Filed Dec. 21, 1987, Ser. No. 135,776
Int. Cl.[4] H04B *3/28*
U.S. Cl. 333—12 **11 Claims**



2. An apparatus for suppressing spurious current flow in a transmission line carrying signals of wavelengths greater than the length of said transmission line and wherein the signals are of frequencies over several octaves, said apparatus for electrically interconnecting a signal source and a signal load, said apparatus including said transmission line and comprising:

at least one means of ferromagnetic material surrounding said transmission line within an electromagnetic field established between said signal source and said signal load and disposed at a position along said transmission line within the middle half relative to the longitudinal length of said transmission line in order to suppress at least the primary standing wave mode of the fundamental frequency of ringing; and

secondary circuit means coupled to said ferromagnetic material means, said secondary circuit means including a short circuit secondary load for terminating spurious current

flows on said transmission line which generate a net current;

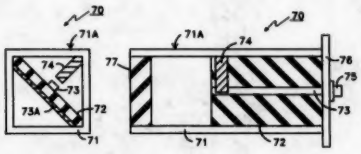
wherein said secondary circuit means is an electrically conductive ribbon loop.

4,885,556

CIRCULARLY POLARIZED EVANESCENT MODE RADIATOR

Bernard J. Lamberty, Kent, and Steven J. Peters, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 1, 1988, Ser. No. 265,538
Int. Cl.[4] H01P 1/16
U.S. Cl. 333—21 A 15 Claims



1. An evanescent mode radiator comprising:

a waveguide operating below its cutoff frequency;

a dielectric substrate disposed diagonally in said waveguide;

a first conductor disposed on a surface of said dielectric substrate;

shunt capacitive means disposed in said waveguide adjacent said first conductor; and

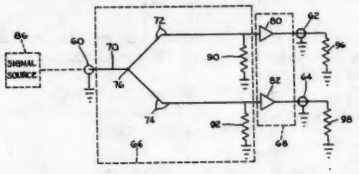
a dielectric window disposed in an end of said waveguide.

4,885,557

BROADBAND CONSTANT VOLTAGE MULTICOUPLER

Daniel A. Barczys, 32 Hess Pl., Lancaster, N.Y. 14086

Filed Aug. 8, 1988, Ser. No. 229,244
Int. Cl.[4] H03H 7/48
U.S. Cl. 333—124 14 Claims



1. A constant voltage multicoupler comprising:

(a) a single input and a plurality of outputs;

(b) a frequency independent, non-resonant transmission line network connected to said input and having a plurality of branches one for each of said outputs and each branch having a termination, said branches having an electrical characteristic such that the voltage is constant throughout said network; and

(c) a plurality of active devices, at least one for each of said outputs, each of said devices having an input connected to a corresponding one of said branches at the termination thereof and an output connected to a corresponding one of said multicoupler outputs, each of said devices providing a desired output impedance value and isolation between said outputs;

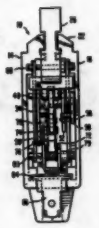
(d) so that the voltage level at each of said branch terminations is substantially the same as the voltage level at said input resulting in no degradation of signal to noise ratio.

4,885,558

CIRCUIT BREAKER

George S. Harper, Cambridge, Md., assignor to Airpax Corporation, Cambridge, Md.

Division of Ser. No. 486,716, Apr. 20, 1983. This application May 22, 1986, Ser. No. 848,169
Int. Cl.[4] H01H 75/00
U.S. Cl. 335—8 14 Claims



1. A multipole circuit breaker, comprising:

a plurality of single pole breaker mechanisms, each breaker mechanism being contained within a nonconductive casing and having a moveable contact member, a stationary contact member, and a toggle mechanism for selectively moving the movable contact member into and out of engagement with the stationary contact member in the casing;

handle means coupled to the toggle mechanism of at least one such breaker mechanism contained in a first casing, said handle means extending out of said first casing to permit manually controlled movement of the handle means and toggle mechanism for selectively manually moving the movable contact member into and out of engagement with the stationary contact member; and

handle link means coupled to the toggle mechanism of a second breaker contained in a second casing, said handle link means being fully enclosed with said second casing;

said handle link means having a laterally extending tapered arm and said handle means having a correspondingly tapered aperture formed therein for receiving and frictionally engaging said arm to permit substantially simultaneous movement of said handle means and handle link means and of said toggle mechanisms,

wherein said laterally extending arm has a longitudinal taper and said aperture has a complementary longitudinal taper,

wherein adjacent walls of said casings have complementary elongated openings therein through which said lateral extension passes;

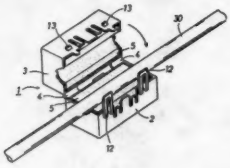
wherein each of said breaker mechanisms comprises shield means located between the adjacent casing walls in the region of said openings for at least partially covering said openings to define a deviated path from the interior of one of said casings, through said opening therein, around said shield means between said casings, through said opening in the other casing and into the interior of the other casing,

wherein an exterior portion of each of said adjacent casing walls comprises a recess formed around said opening; and means for movably mounting said shield means within said recesses.

4,885,559
ELECTRIC NOISE ABSORBER

Yoshihito Nakano, Yokohama, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 25,059, Mar. 12, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 205,578
Claims priority, application Japan, Aug. 29, 1986, 61-133476[U]
The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.
Int. Cl.[4] H01F 17/06, 27/02, 27/26
U.S. Cl. 336—92 10 Claims



1. An electric noise absorber for surrounding a cord of an electronic device comprising:

two bodies of magnetic substance, each having a hemi-cylindrical groove for receiving the cord;

two case members for covering the cord when interlocked, each case member containing one said body; and

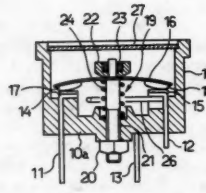
means for selectively interlocking said case members such that said bodies surround said cord,

wherein each said body has side grooves and each said case member has flexible projections for securing the body in the case member by engaging with the side grooves.

4,885,560
THERMAL RELAY

Masahiko Niino, Yamada Electric Mfg. Co., Ltd., 55, Kami Iida Minami-machi 5 Chome, Kita-ku, Nagoya, Japan

Filed Feb. 22, 1989, Ser. No. 313,756
Claims priority, application Japan, Sep. 21, 1988, 63-123318
Int. Cl.[4] H01H 37/02, 71/18
U.S. Cl. 337—3 2 Claims



1. A thermal relay comprising:

(a) a housing;

(b) two fixed contacts provided in the housing;

(c) a disc-shaped bimetallic member having two movable contacts and provided in the housing, the disc-shaped bimetallic member usually having a first curvature such that the movable contacts are made into engagement with the fixed contacts, respectively, the disc-shaped bimetallic member reversing its curvature so as to have a second curvature when heated to a predetermined value of its temperature, whereby the movable contacts are made out of engagement with the fixed contacts, respectively;

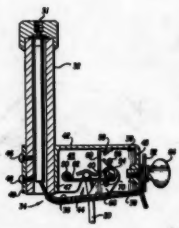
(d) an adjusting screw provided in the housing and comprising a screw portion and a head portion independent from the screw portion, the screw portion and head portion being coupled with each other by a meltable metal; and

(e) a spring member biasing the disc-shaped bimetallic member to the head portion of the adjusting screw, thereby supporting the disc-shaped bimetallic member.

4,885,561
TRANSFORMER OVERLOAD AND FAULT PROTECTION APPARATUS

Edward F. Veverka, Racine, and Stephen P. Hassler, Muskego, both of Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 15, 1988, Ser. No. 271,288
Int. Cl.[4] H01H 85/02, 71/10
U.S. Cl. 337—190 16 Claims



1. An overload and fault protector for a distribution transformer having an electrical lead end, comprising:

a fuse assembly having at least one fuse link adapted to separate upon an overload or fault condition,

ejector means for electrically connecting and disconnecting the lead end to said fuse link, said ejector means including means for supporting the lead end in electrically conductive contact with said fuse link, said supporting means being responsive to the separation of said fuse link to release the lead end and to permit the lead end to fall away from its electrically conductive contact with said supporting means at least in part under the influence of gravity.

4,885,562
MICROWAVE DELAY CIRCUIT HAVING A BRIDGE-T CIRCUIT

Pierre-Louis Ouvrard, Sevres, and Philippe Dueme, Palaiseau, both of France, assignors to Electronique Serge Dassault, Saint Cloud, France

Filed Dec. 9, 1987, Ser. No. 130,852
Claims priority, application France, Jul. 20, 1987, 87 10240
Int. Cl.[4] H03H 7/07, 7/19, 7/30
U.S. Cl. 333—139 11 Claims

3. A microwave delay circuit comprising:

at least one bridged-T section type two-port network connected as an all-pass filter and having a phase law which is a linear function of frequency, said two-port network being mounted such that it can be switched in parallel with a direct path which substantially constitutes a short circuit; and

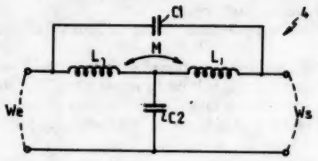
wherein the bridged-T section type two-port network comprises:

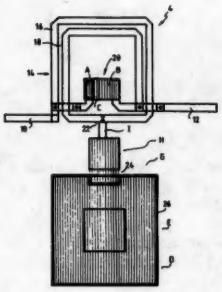
two inductors having the same inductance L connected in series to form the two arms of the T, the inductors having a mutual inductance M;

a capacitor having one end connected to the junction of the two inductors to define a riser of the T, the capacitor having a capacitance C_2; and

another capacitor connected in parallel to the series connected inductors to form the bridge of the bridged-T section, said bridge capacitor having a capacitance C_1;

and wherein the circuit substantially satisfies the relationship:





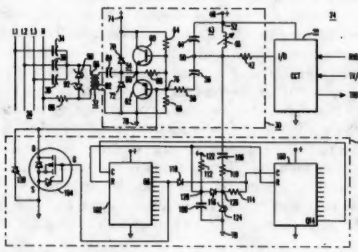
$$C_2 \cdot \left(\frac{L-M}{L+M}\right) = 4 \cdot C_1.$$

4,885,563

POWER LINE CARRIER COMMUNICATION SYSTEM

Richard A. Johnson, Murrysville Boro; Arthur A. Anderson, Irwin, and Dirk J. Boomgaard, Monroeville Borough, all of Pa., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed May 3, 1988, Ser. No. 189,895
Int. Cl.[4] H04M *11/06*
U.S. Cl. 340—310 A 8 Claims



1. A power line carrier communication system for sending and receiving communication signals over an electrical power line, comprising:

a carrier current transceiver (CCT),

a bi-directional coupling interface disposed between said CCT and the electrical power line,

said CCT having an input/output (I/O) port for receiving serial signals (RX Signals) from the electrical power line, and for applying serial signals (TX Signals) to the electrical power line, via said coupling interface,

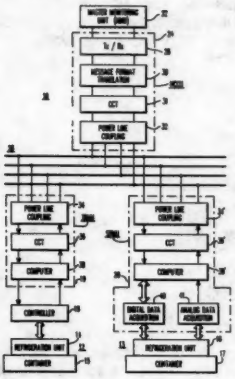
said coupling interface including impedance means connected to provide a predetermined high receiving impedance, and solid state switching means automatically operative in response to TX Signals to effectively bypass the impedance means which provides the high receiving impedance and provide a predetermined low output drive impedance.

4,885,564

POWER LINE CARRIER COMMUNICATION SYSTEM FOR MONITORING REFRIGERATED CONTAINERS

Leonard C. Vercellotti, Oakmont; Arthur A. Anderson, Irwin, both of Pa.; David A. Christiansen, Bloomington; Dannis R. Johnson, Savage, both of Minn.; Laurence R. Brickner, Marathon, N.Y.; Robert G. Colclaser III, North Huntingdon, Pa., and John G. Leddy, Lexington, Mass., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed May 3, 1988, Ser. No. 189,566
Int. Cl.[4] H04M *11/04*
U.S. Cl. 340—310 A 9 Claims



1. A power line carrier communication system for monitoring refrigerated containers, comprising:

a local electrical distribution power line,

a master monitoring unit,

a first power line interface between said master monitoring unit, and said local electrical distribution power line,

a plurality of refrigerated containers,

and a plurality of remote monitoring units, one for each refrigerated container to be monitored by said master monitoring unit,

said master monitoring unit preparing and transmitting messages to said first power line interface in a first message format,

said first power line interface including means for transmitting messages to and receiving messages from said master monitoring unit, message translating means, and means for applying messages to and receiving messages from said local electrical power distribution line,

said message translating means translating messages received from the master monitoring unit which are to be applied to the local electrical distribution power line into a second format, and translating messages received from the local electrical distribution power line to the first message format,

each of said remote monitoring units including means for receiving said second format messages from said local electrical distribution power line, and processing means for processing said second format messages, with said

processing means including means for obtaining status information from an associated refrigerated container, means for incorporating said status information into a message having the second message format, and means for applying said status message to the local electrical distribution power line.

said second format including message information which includes a predetermined periodic logic level for at least one bit of every ten message bits, and a message starting preamble which includes the same logic level for at least ten consecutive bits, with this ten bit message starting logic level being different than said predetermined periodic logic level,

said first message format including a field position which indicates type of assignment to be performed by the first power line interface in messages received from the master monitoring unit, and wherein the first power line interface uses said same field position to indicate assignment success or failure in messages sent to the master monitoring unit.

4,885,565

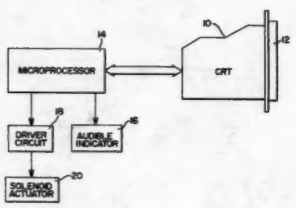
TOUCHSCREEN CRT WITH TACTILE FEEDBACK

James T. Embach, Rochester Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 1, 1988, Ser. No. 200,888

Int. Cl.[4] G08B *1/00*

U.S. Cl. 340—407 **4 Claims**



1. Apparatus for providing acknowledgment of a touch input command of a user to the touchscreen of a cathode ray tube of a CRT command and display system, the apparatus comprising in combination:

shock mounting means for mounting the cathode ray tube, the mounting means allowing limited movement of the cathode ray tube;

an actuator means for imparting motion to the cathode ray tube when the actuator means is energized;

energizing means responsive to a touch input command of the user to the touchscreen of the cathode ray tube for energizing the actuator means, whereby tactile feedback is provided to the user by the motion imparted to the cathode ray tube by the actuator means to acknowledge the touch input command.

4,885,566

APPARATUS FOR DETECTING THE WEARING OF A SEAT BELT ASSEMBLY

Kohji Aoki, Nagoya; Tomio Yasuda, Kasukabe; Sugiyama Masanori, Nishio, and Komazawa Osamu, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 22, 1987, Ser. No. 136,927

Claims priority, application Japan, Dec. 22, 1986, 61-305926; Dec. 23, 1986, 61-307063; Feb. 25, 1987, 62-042242

Int. Cl.[4] B60Q *11/00*

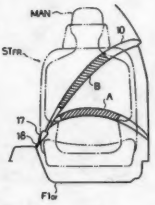
U.S. Cl. 340—457.1 **50 Claims**

1. In a vehicle including a seat and a seat belt, an apparatus for detecting whether an occupant seated on said seat is wearing said seat belt, said apparatus comprising:

a seat belt assembly including said belt which may be disposed around said occupant;

a belt electrode positioned along at least a portion of said belt;

a detecting electrode positioned so as to produce an electric field between said belt electrode and said detecting electrode and passing through at least part of said occupant when said belt is disposed around said occupant;



capacitance detecting means for detecting the capacitance formed between said belt electrode and said detecting electrode; and

monitoring means responsive to changes in the detected capacitance for monitoring the detected capacitance to determine whether said belt is disposed around said occupant.

4,885,567

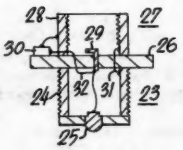
VEHICULAR BACK-UP LAMP ALARM DEVICE

Danny Katz, 60 Sutton Place, South, New York, N.Y. 10022

Division of Ser. No. 110,012, Oct. 19, 1987, abandoned. This application May 4, 1989, Ser. No. 348,076

Int. Cl.[4] B60Q *1/26*

U.S. Cl. 340—463 **2 Claims**



1. A socket converter forming a lamp alarm device, comprising: opposite disposed open and closed cylindrical shells affixed to a flat, thin insulating support member disposed between and isolating the shells which are electrically connected to each other, said shells and said insulating support of said socket converter forming a lamp base having a base contact button adapted to be inserted in a lamp socket and further forming a lamp socket with a base contact spring adapted to receive therein the base of a lamp bulb to be mated with said open cylindrical shell; a sonic element mounted on said insulating support member and having a pair of electrical conductors one of which is connected permanently to both said base contact button and said base contact spring and the other connected permanently to said open cylindrical shell.

4,885,568

INTEGRATED ALARM TRANSPONDER

Kenneth R. Hackett, Boulder, Colo., assignor to Interactive Technologies, Inc., North St. Paul, Minn.

Filed Nov. 21, 1988, Ser. No. 273,927

Int. Cl.[4] G08B *26/00*

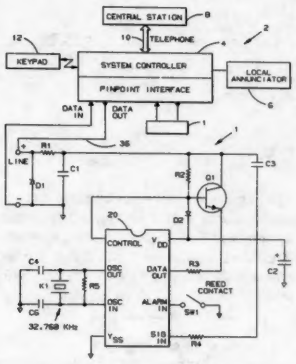
U.S. Cl. 340—518 **11 Claims**

7. In a time multiplexed hardwired alarm system having a local controller monitoring each of a plurality of distributed

alarm points, apparatus for identifying the alarm status of each alarm point during an assigned response interval within a system reporting interval comprising:

(a) means for monitoring a physical condition for an alarm condition; and

(b) transceiver means hardwired to said controller including a nonvolatile, eraseable memory for receiving a first binary pair of frequencies and programming a unique alarm reporting interval within the system interval different from the other alarm points into said memory and for receiving a predetermined one of a second binary pair of frequencies different from said first pair and redundantly reporting the alarm status of said switch each successive system reporting intervals initiated thereafter by the predetermined one of said second pair of frequencies.



4,885,569

METHOD AND DEVICE FOR TRANSFERRING SIGNALS BETWEEN MODULES OF AN ELECTRONIC UNIT

Isaac M. Lellouche, 2 rue Hegesippe Moreau, Paris, France

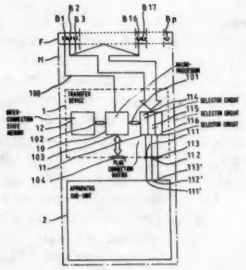
PCT No. PCT/FR87/00132, § 371 Date Dec. 18, 1987, § 102(e) Date Dec. 18, 1987, PCT Pub. No. WO87/06740, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 22, 1987, Ser. No. 145,763

Claims priority, application France, Apr. 22, 1986, 86 05759

Int. Cl.[4] H04M *9/02*

U.S. Cl. 340—826 **11 Claims**



1. A method for simultaneously transferring useful signals between connection points distributed between modules of an electronic assembly, each signal being transmitted at least substantially continuously between a transmitting connection point and at least one receiving connection point, which method comprises:

(a) providing a double transfer line common to the assembly of modules, said double transfer line being formed by a group of physical conductors and comprising:

(i) a linking line with at least one linking conductor to which all the modules are connected to be capable of continuous dissemination of digital messages between modules; and

(ii) a connection line comprising several connection conductors connectable selectively to each of the connection points for transferring said useful signals;

(b) attributing to each connection point and to each connection conductor an identification code; and

(c) disseminating interconnection reconfiguration commands by at least one of the modules directly to each of the modules and by means of the linking line, indicating, by means of said identification codes, at least one connection conductor of said connection line and one or more connection points to be connected thereto or disconnected therefrom, every module complying with any connection or disconnection order detected in a command and which relates to one of its connection points, following which the transfer of signals takes place between the connection points connected by the new interconnection reconfiguration thus formed.

4,885,570

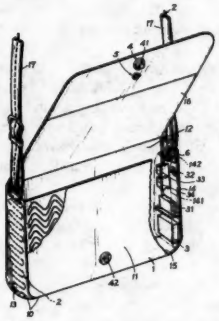
STEAL AND BURGLAR PREVENTIVE PURSE

Darin Chien, 4F, No. 276, Pa-Teh Rd., Sec. 4, Taipei, Taiwan

Filed Nov. 30, 1988, Ser. No. 277,693

Int. Cl.[4] G08B *13/14*; A45C *13/24*

U.S. Cl. 340—571 **9 Claims**



1. A steal or burglar preventive purse comprising:

a purse means having a casing composed of a plurality of sheet members with a handle or belt holding two side portions of the casing and a cover normally closing said casing;

a built-in sensing network including a continuous wavy wire continuously distributed in a generally full area of the casing; and

an alarm circuit means having a main switch of a power source, a short-alarming buzzer electrically connected with a first pair of terminals respectively formed on said cover and a front sheet member of said casing and a long-alarming buzzer electrically connected with a second pair of terminals, across which said continuous wavy wire of said built-in sensing network is connected thereto, each said buzzer having each said pair of terminals nomally closed; whereby upon a cutting or breaking of the wavy wire of said sensing network to disconnect said second pair of terminals of said alarm circuit means bya thief or pickpocket, said long-alarming buzzer is actuated to re-

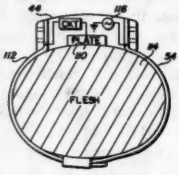
mind a purse owner to prevent its stealing, until switching off said main switch of the alarm means, and upon an opening of said cover by the purse owner to disconnect said first pair of terminals of said alarm circuit means, said short-alarming buzzer is actuated for its sounding.

4,885,571

TAG FOR USE WITH PERSONNEL MONITORING SYSTEM

James D. Pauley, Estes Park, and Allen E. Ripingill, Jr., Louisville, both of Colo., assignors to B. I. Incorperated, Boulder, Colo.

Continuation of Ser. No. 852,831, Apr. 15, 1986, abandoned. This application Aug. 12, 1988, Ser. No. 231,823
Int. Cl.[4] G08B *23/00*; H04B *1/34*
U.S. Cl. 340—573 **16 Claims**



1. A tag for use with an individual monitoring system comprising:

a self-contained power source;

circuit means coupled to said power source for periodically generating an encoded signal, said encoded signal including identification information and status information;

sensing means for sensing when said tag is held near human flesh; and

mode control means for allowing said circuit means to selectively operate in one of a plurality of operating modes;

said status information including an indication of whether said tag is being held near human flesh; and

said mode control means including switch means responsive to the application of an external force, and wherein said operating modes include:

an off mode, wherein no external force has yet been applied, and the circuit means of said tag is disabled, thereby conserving the energy of said self-contained power source,

a start-up/test mode, initiated by applying and maintaining said external force, during which said circuit means is enabled and operates in a test mode that allows operation of the tag to be verified, and

a normal run mode, initiated upon removal of the external force, during which said circuit means generates said encoded signal at prescribed intervals.

4,885,572

ANTI-THEFT ALARM DEVICE FOR VEHICLE

Keisuke Iwata, Tokyo, and Yoshikazu Kojima, Urawa, both of Japan, assignors to Iwata Electric Co., Ltd. and Kobishi Electric Co., Ltd., both of, Japan

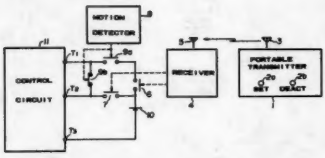
Filed Dec. 30, 1988, Ser. No. 292,250
Int. Cl.[4] G08B *1/00*; B60R *25/10*
U.S. Cl. 340—425.5 **7 Claims**

1. An anti-theft alarm device for a vehicle, the device comprising:

(a) means for detecting an emergency of the vehicle and for emitting, in response to said emergency, a detection signal;

(b) switch means for setting and deactivating the alarm device, said switch means operable to selectively transmit a set signal in response to the activation of the alarm device, and a deactivation signal in response to the activation of the alarm device;

(c) control means, responsive to said means for detecting, for generating an alarm signal having a first electrical current level, and responsive to said switch means, for generating a confirmation signal having a second electrical current level which is lower than said first electrical current level; and



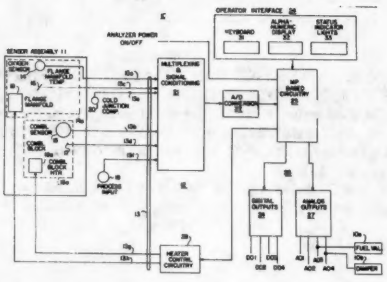
(d) sound emitting means, responsive to said alarm signal, for generating an alarm sound having a first audible sound level and, responsive to said confirmation signal, for generating a confirmation sound having a second audible sound level which is lower in sound level than said first audible sound level of said alarm sound.

4,885,573

DIAGNOSTIC SYSTEM FOR COMBUSTION CONTROLLER

John J. Fry; George Hall, II, both of Wickliffe, and Robert A. Smith, Mentor, all of Ohio, assignors to Gas Research Institute, Chicago, Ill.

Filed Aug. 12, 1987, Ser. No. 84,689
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—519 **11 Claims**



1. In a combustion control system including a sensor assembly having sensor means for providing an output signal indicative of at least one parameter of the process, a process controller means comprising: input means for receiving the output signals provided by the sensor means, processing means for processing the signals and generating control outputs to maintain a desired operation of the process, said signal processing means including monitoring means for continuously monitoring parameters of the combustion control system including parameters of the sensor means and generating an alarm signal whenever any one of the parameters deviates from a setpoint value, display means controlled by said signal processing means for displaying alarm conditions, and said signal processing means including prioritization means for automatically prioritizing the alarms to provide a display of select alarm conditions based on detailed knowledge of internal operations of an analyzer system which is a direct result of a construction of said analyzer system, and the combustion control system and said prioritization means disregard suspect sensor readings

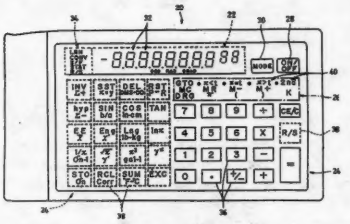
through a program contained in a memory of the combustion control system.

4,885,574

DISPLAY AND KEYBOARD PANEL

Hidetaka Negishi, Machida, and Shigemitsu Aoki, Tokyo, both of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 872,565, Jun. 10, 1986, abandoned. This application Mar. 22, 1989, Ser. No. 326,424
Claims priority, application Japan, Jun. 19, 1985, 60-135085
Int. Cl.[4] H01H *9/16*
U.S. Cl. 340—711 **7 Claims**



1. An electronic device having a display and keyboard panel comprising:

said electronic device having saiddisplay area and said keyboard area;

said keyboard area having said plurality of switches, each of said first plurality of switches providing a constant input to said electronic device and providing a visual indication at each of said first plurality of switches of the function thereof represented by said constant input,

said display area being responsive to said first plurality of switches to provide an indication thereon responsive to the switch being actuated; and

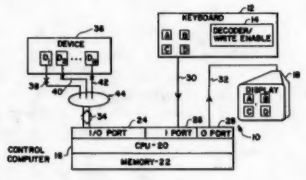
an indication area located adjacent said keyboard area having a second plurality of switches uniquely responsive to each of plural mode settings of said electronic device to provide different variable inputs to said electronic device for each of said plural mode settings and to provide at each of said second plurality of switches a visual display of the current function thereof represented by said variable input.

4,885,575

METHOD AND MEANS OF DISPLAYING INFORMATION

Leon G. Williams, 467 Portland Ave., St. Paul, Minn. 55102

Filed May 7, 1984, Ser. No. 607,548
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—712 **6 Claims**



1. A device for displaying information comprising:

means for inputting data by activating a switch;

means for storing current values of first and second parameters of a system or apparatus, and for storing the possible values of each of said parameters;

means for selecting either said first or said second parameter as the parameter to be displayed in response to activating said switch;

means for retrieving from said means for storing, said possible values of the one of said parameters selected by said means for selecting; and

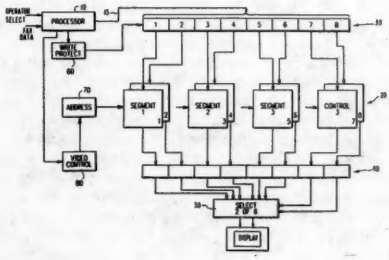
means for displaying said one of said parameters selected by said means for selecting and said possible values of said one of said parameters, wherein said one of said parameters and said possible values of said one of said parameters are displayed at the same location on said means for displaying irrespective of which of said parameters is selected.

4,885,576

SOFT COPY DISPLAY OF FACSIMILE IMAGES

William B. Pennebaker, Carmel; Joan L. Mitchell, Ossining, and Frederick C. Mintzer, Shrub Oak, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1986, Ser. No. 847,376
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—793 **37 Claims**



1. A method of displaying an operator selected portion of an image, on a display with inadequate area to perceivably display the entire image simultaneously, comprising the steps of:

(a) dividing the image area into at least first and second area segments, each of said segments being perceivably displayable by the pixels within said display area;

(b) storing representation information of the first segment in a multi-bit plane buffer using a first group of bit planes comprising less than all of the bit planes in said buffer;

(c) storing representation information of the second segment in the multi-bit plane buffer using a second, distinct, group of said bit planes; and

(d) displaying an operator selected portion of said image area on said display by selecting, for each pixel of said display, representation information, as appropriate, from the first or the second group of bit planes, in accordance with the portions of the area segments making up said selected area portion.

4,885,577

PAGING SYSTEM FOR PROVIDING A DATA MESSAGE AND A VOICE MESSAGE TO A UNIQUE ADDRESS OF A PAGING RECEIVER

Leonard E. Nelson, Boynton Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 2, 1988, Ser. No. 162,838
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.44 **19 Claims**

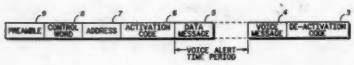
1. A paging system for transferring a voice related data message within a tone and voice selective call paging signal to a paging receiver, said system comprising:

a paging controller for receiving mutually related voice and data information from an entry device;

an encoder responsive to said paging controller for encoding the related voice and data information into corresponding voice and data messages, wherein the data and voice messages are combined into a tone and voice selective call paging signal designated for at least one unique paging receiver, wherein said tone and voice paging signal includes a predetermined time period followed by the voice message and an activation signal for notification of the start of said predetermined time period, and further wherein the related data message is included within the predetermined time period;

a transmitter, being responsive to said encoder, for transmitting said tone and voice selected to call paging signal including said voice related data message to the paging receiver;

a receiving means included in the paging receiver for receiving said tone and voice selective call paging signal;



a decoding means, being responsive to said receiving means, for decoding the received tone and voice selective call paging signal to recover the mutually related data and voice messages and activation signal thereof;

processing means, being responsive to said decoding means and notified of the start of the predetermined time period by the recovered reactivation signal, for processing said recovered related data and voice messages to generate respectively an alphanumeric information signal and voice information signal;

display means, being responsive to said processing means, for visually displaying on said display means, alphanumeric characters corresponding to the alphanumeric information signal; and

speaker means, being responsive to said processing means, for producing audible sounds corresponding to the voice information signal wherein a voice alert is generated during the predetermined time period and further wherein the data message is received during the predetermined time period.

4,885,578

IN BAND CONNECTION ESTABLISHMENT FOR A MULTIPLE MULTI-DROP NETWORK

Kenneth J. Perry, Riverdale; Yannick J. Thefaine, Beacon; Brent T. Hailpern, Katonah, all of N.Y.; Lee W. Hoevel, Spring Valley, Ohio, and Dennis G. Shea, Danbury, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1986, Ser. No. 940,891

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.52 **4 Claims**

4. A method of establishing communication between n processors connected by n multi-drop links, where n is an integer, said method comprising the steps of:

assigning each one of said n processors a different predetermined one of said n multi-drop links as a contention free transmit link;

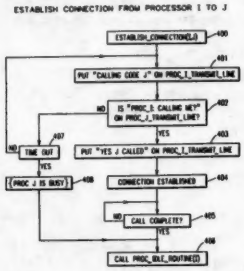
assigning each one of said n processors a different unique calling code;

transmitting by a first one of said n processors on its assigned transmit link the unique calling code of a second one of said n processors with which said first one of said n processors wants to establish a connection for communication purposes:

checking all links other than its own transmit link, by said second one of said n processors to determine if it is receiving its own calling code on the assigned transmit link of another one of said n processors;

determining that said second one of said n processors is not already busy; and

establishing a connection between said first and second one



of said n processors following the determination that said second one of said n processors is not already busy, and in response to said second one of said n processors determining that said first one of said n processors is transmitting said second one of said n processors unique calling code on said first one of said n processors assigned transmit link.

4,885,579

DEVICE FOR THE REMOTE CONTROL OF A VIDEORECORDER OR A VIDEORECEIVER

Charles P. Sandbank, Reigate, United Kingdom, assignor to British Broadcasting Corporation, London, England

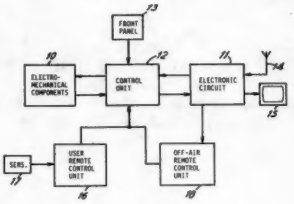
PCT No. PCT/GB87/00259, § 371 Date Apr. 25, 1988, § 102(e) Date Apr. 25, 1988, PCT Pub. No. WO87/06416, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 16, 1987, Ser. No. 134,775

Claims priority, application United Kingdom, Apr. 18, 1986, 8609524

Int. Cl.[4] H04N *5/782, 7/087*

U.S. Cl. 340—825.72 **10 Claims**

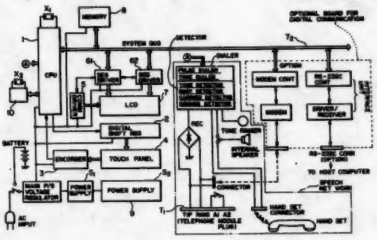


1. A video recorder including electromechanical components, an electronic circuit and a main control unit therefor, a first remote control unit responsive to user input signals to provide control signals to the main control unit and a second remote control unit responsive to received control signals accompanying a received television signal, to decode the received control signals and provide to the main control unit control signals which simulate those provided by the first remote control unit, whereby said first and second remote control units can act independently as parallel, alternative means of control.

4,885,580
MULTI-FUNCTION KEY INPUT DEVICE

Hiroshi Noto; Nobuyuki Hayashida; Taketoshi Kojima; Makoto Ito, all of Yokohama, and Osamu Kambayashi, Ise, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Continuation of Ser. No. 670,624, Jan. 13, 1984, abandoned. This application Mar. 15, 1988, Ser. No. 170,139
Claims priority, application Japan, Nov. 14, 1983, 58-212442
Int. Cl.[4] G09G 3/02
U.S. Cl. 341—23 2 Claims



1. A multifunction key input device comprising:

a case having a liquid crystal display section on a top surface thereof;

central processing means built in said casing including means for controlling operation of the device in a plurality of user-selectabel operational modes, including a data entry mode;

a user activatable touch panel in the form of a matrix pattern including at least one variable display section, wherein cross-points of the matrix define key input positions flush with the surface of the panel, said central processing means further including means for selecting cross-points of said variable display section as user activatable key input positions and displaying indicia to be used for key input position legends, means for individually selecting a legend for display at a particular key input position, and means for selecting between said plurality of operating modes, wherein at least one operating mode includes at least one key position at a different location in said variable display section than in another operating mode;

memory means for storing a plurality of displays corresponding to different operational modes and data representing legend indicia, including legend indicia selected by the user by activating the panel in data entry mode;

a liquid crystal display board disposed within said liquid crystal display section;

a common driver and segment drivers for driving said liquid crystal display board to produce a display corresponding to an operational mode thereon;

a plate-shaped light source disposed within said liquid crystal display section so as to be parallel with and proximate to a surface of said liquid crystal display board furthest removed from said top surface of the liquid crystal display board in the casing; and

a transparent sheet;

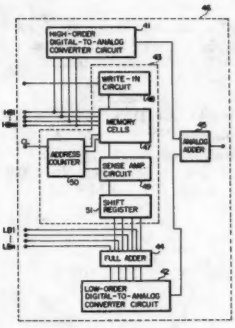
said touch panel and said transparent sheet being disposed within said liquid crystal display section such that each is parallel with said liquid crystal display board, said touch panel being proximate to a surface of the liquid crystal display board closest to the top surface of the casing and said transparent sheet being proximate to, and substantially contiguous with, the top surface of the casing so as to provide a protective cover for said liquid crystal display section;

said central processing means further including means for reading the touch panel as it is activated by the user, for storing the legend indicia selected by the user in the memory means for causing the liquid crystal display section to subsequently display the user selected indicia as legends for particular selected key input positions in the display corresponding to the selected operational mode.

4,885,581
DIGITAL-TO-ANALOG CONVERTER CIRCUIT

Mitsutoshi Sugawara, and Nami Inamasu, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,060
Claims priority, application Japan, Feb. 27, 1987, 62-45713; Jun. 3, 1987, 62-140226
Int. Cl.[4] H03M 1/00
U.S. Cl. 341—145 17 Claims



1. A digital-to-analog converting circuit for converting a digital input signal into an analog output signal, said digital input signal consisting of high-order bits representing one of plural values and low-order bits including the least significant bit, comprising:

(a) first digital-to-analog converting means operative to produce a first analog signal the amount of which corresponds to one of said plural values;

(b) memory means having a plurality of addresses each storing a piece of error data information in the digital form for each of said plural values, one of said addresses being specified by said high-order bits for reading out the piece of error data information stored therein;

(c) arithmetic means operative to carry out an arithmetic operation on said low-order bits provided in the digital form and said piece of error data information provided in the digital form to produce an amended low-order bits in the digital form;

(d) second digital-to-analog converting means supplied with said amended low-order bits in the digital form and operative to produce a second analog signal the amount of which corresponds to a value represented by said amended low-order bits; and

(e) an analog adder operative to add said first analog signal to said second analog signal to produce an analog output signal, said first analog signal being weighted by a predetermined factor in said analog adder.

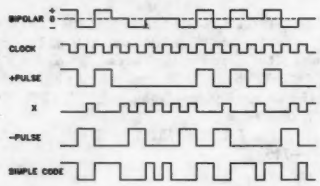
4,885,582
"SIMPLE CODE" ENCODER/DECODER

Steven B. LaBarge, Grass Valley, and Bruce Waggoner, Nevada City, both of Calif., assignors to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Sep. 28, 1987, Ser. No. 101,905
Int. Cl.[4] H03M 5/18
U.S. Cl. 341—57 7 Claims

1. A method for converting a ternary signal on a signal input line into a binary signal comprising the steps of:

generating a high value for the binary signal when the value of the ternary signal is positive;
generating a low value for the binary signal when the value of the ternary signal is negative; and



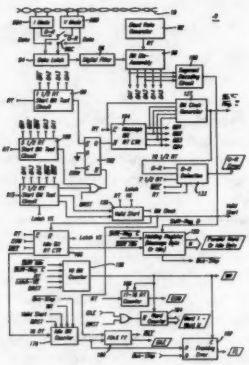
generating an alternating high/low signal for the binary signal when the value of the ternary signal is zero..

4,885,583

SERIAL TO PARALLEL DATA CONVERSION SYSTEM

John M. McCambridge, Northville, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Nov. 14, 1988, Ser. No. 270,918
Int. Cl.[4] H03M *9/00*
U.S. Cl. 341—100 **9 Claims**



1. A data reception system for converting serial data messages transmitted over a balanced differential mode communications link at a chosen transfer rate into corresponding parallel data messages for use by an end-user device, the data messages being transmitted as a series of individual mark and space signals of a chosen signal level, the messages comprising a space at the beginning of a word of the message to indicate a start of the message word and a mark at the end of a word to indicate the end of a message word and mixtures of a chosen number of mark and space signals representation of the word with an interval of a chosen number of idle bits placed between the messages, said system comprising:

(a) means for converting the individual mark and space signals into corresponding individual HIGH and LOW unfiltered binary logic bits, said converting means including means for preventing conversion into binary bits the individual mark and space signals which exceed the chosen signal level;

(b) means for determining the start and stop bits and each data bit of each message word;

(c) means for determining the idle bit intervals; and

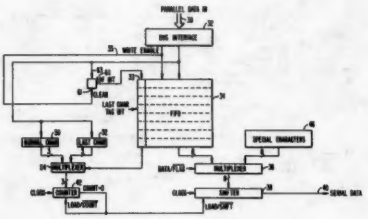
(d) means for forming a parallel message word from a series of bits established from said determining means for start and stop bits and said determining means for idle bit intervals response to the reception of each serially transmitted data message, said means for forming a parallel message word making available said parallel message to the end-user device.

4,885,584

SERIALIZER SYSTEM WITH VARIABLE CHARACTER LENGTH CAPABILITIES

Monte J. Dalrymple, Fremont, Calif., assignor to Zilog, Inc., Campbell, Calif.

Filed Apr. 7, 1988, Ser. No. 178,562
Int. Cl.[4] H03M *9/00*
U.S. Cl. 341—101 **10 Claims**



1. An apparatus for converting parallel data into serial data, said parallel data arranged in a serial stream of characters each including a number of parallel bits, wherein the characters include the same number of bits, said number of bits defining the normal character length, except that the number of bits in the last character in the serial stream is different from the normal character length, said apparatus comprising:

first means for storing the serial stream of characters so that the characters are retrievable in the same order as that in the serial stream;

means for retrieving each character from the storing means and serially shifting each character to form a serial bit stream;

second means for storing the number of bits in the last character;

third means for storing the normal character length;

means for tagging the characters with tags so that the last character is distinguishable from the characters of normal length by their tags;

means responsive to the tag of a character for selecting between the normal character length and the number of bits in the last character and for controlling the retrieving and shifting means, so that the retrieving and shifting means shifts said character for the selected number of times.

4,885,585

RAMP GENERATOR RESET CIRCUIT

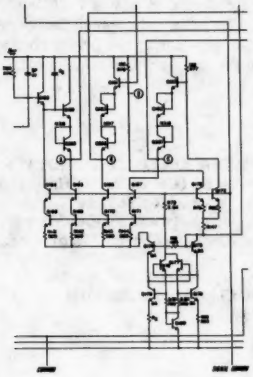
Jeffrey G. Barrow, Oak Ridge, N.C., and Adrian P. Brokaw, Burlington, Me., assignors to Analog Devices, Inc., Norwood, Me.

Division of Ser. No. 945,654, Dec. 23, 1986, Pat. No. 4,742,331.
This application May 2, 1988, Ser. No. 189,290
Int. Cl.[4] H03M *1/56*
U.S. Cl. 341—169 **15 Claims**

1. In a ramp generator circuit having a capacitor which is charged to generate a ramp voltage, a shorting transistor, having base, emitter and collector leads, which shorting transistor is connected across said capacitor to electrically short said capacitor to reset said ramp generator circuit, means connected to said base lead of said shorting transistor for supplying current to said base lead to turn said transistor on, a first current switch connected to the base lead of said shorting transistor to draw current away from the base lead and switch said shorting transistor off and a flip-flop for controlling the

operation of said first current switch, a high-speed reset circuit responsive to a reset signal comprising,

a second current switch connected in series with said first



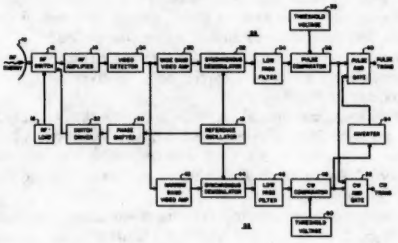
current switch, which second current opens in direct response to said reset signal, thereby allowing said current supply means to turn on said shorting transistor and reset said ramp generator circuit.

4,885,586

CIRCUIT FOR DETERMINING TRANSMITTER MODULATION CHARACTERISTICS

Mervyn C. Hoover, and Michael L. Schmitt, both of Ridgecrest, Calif., assignors to In the United States of America as Represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 17, 1978, Ser. No. 926,973
Int. Cl.[4] G01S 7/36
U.S. Cl. 342—13 **10 Claims**



1. A radiometer circuit for determining the character of the modulation of a received signal comprising:

antenna means adapted to receive a signal and having an output;

a reference termination;

switching mans having multiple inputs and at least one output;

one of said multiple inputs to said switching means being operatively connected to said antenna means;

another of said multiple inputs to said switching means being operatively coupled to said reference termination;

detector means having an input operatively coupled to said at least one output of said switching means for detecting a differential energy level and having an output;

oscillator means having multiple outputs one of which is operative.y coupled to one of said multiple inputs to said switchin g means to cause said switching means to commutate the input of said detector means between said antenna means and said reference termination;

wide-band and narrow-band radiometry channels operatively connected to the output of said detector means and each having an output;

said narrow-band channel being operative differentiate pulse signals from continuous wave signals;

continuous wave determining means having inputs operatively coupled to the output of each said narrow-band channel and wide-band channel and having an output therefrom corresponding to an indication of continuous wave modulation when the output from each of said broadband and narrow-band channels are present simultaneously at the input thereto and having another output corresponding to an inverted output;

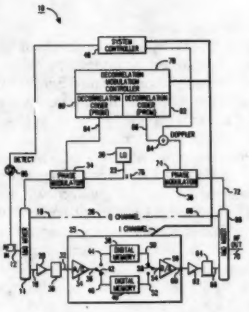
pulse determining means having inputs operatively coupled to the output of said broadband channel and said another output from said continuous wave determining means and having an output corresponding to an indication of pulse modulation when the output from said broadband channel and said inverted output are present simultaneously at the input thereto.

4,885,587

MULTIBIT DECORRELATED SPUR DIGITAL RADIO FREQUENCY MEMORY

Richard J. Wiegand, Severna Park; Peter M. Buerger, Baltimore, and Richard E. Marinaccio, Crofton, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1988, Ser. No. 288,376
Int. Cl.[4] G01S 7/38
U.S. Cl. 42—14 **21 Claims**



1. A multibit decorrelated spur digital radio frequency memory (DRFM) for replicating an analog RF input signal without significant spurious signals (spurs) over a given range of harmonics of said RF signal, said DRFM suitable for use as a coherent RF memory (CRFM) in a military electronic countermeasures system comprising:

an RF local oscillator (LO) for producing a local oscillator mixing signal;

a first mixer for mixing the RF and the LO signals in order to convert the RF input signal into an analog intermediate frequency (IF) signal representative of the RF signal;

at least one multibit sampling means for sampling the IF signal at a selected bit rate to thereby convert the analog IF signal into digital values representative of the RF signal;

digital memory means for storing the digital values representative of the RF signal for later retrieval therefrom;

at least one digital-to-analog (D/A) converter for converting the retrieved digital values into a retrieved analog IF signal;

a second mixer for converting the retrieved IF signal into an RF signal which is a replica of the input RF signal;

modulating means for modulating the LO signal with a decorrelation waveform when the LO signal is mixed with the RF input signal and when the LO is mixed with the retrieved IF signal; and

control means for controlling the modulation means and the number of bits of the sampling means such that over the range of harmonics, spurs are produced only at harmonics corresponding to the selected number of bits of the sampling means and the modulation means is sufficient to decorrelate at least the spurs produced as a result of said selected number of sampling bits.

4,885,588

RADAR TRANSPONDER

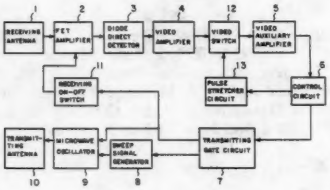
Youichi Kawakami, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,396

Claims priority, application Japan, Sep. 22, 1987, 62-236152

Int. Cl.[4] G01S *13/80*

U.S. Cl. 342—51 **3 Claims**



1. A radar transponder comprising:

a video amplifier for amplifying a detected output of a receiving signal up to a definite level;

an auxiliary video amplifier for amplifying an output amplified by the video amplifier up to the level necessary for triggering a control circuit;

said control circuit being triggered by an output of the auxiliary video amplifier to generate a pulse for producing a transmitting time of the radar transponder;

said radar transponder having a video switch provided between said amplifier and said auxiliary amplifier to switch over from a closed state in which a signal applied to said auxiliary amplifier from said amplifier is broken by a positive potential pulse input synchronized with an output signal from said control circuit and brought int a high level only during the transmitting period of the radar transponder to an open state in which the signal applied to said auxiliary amplifier from said amplifier being conducted by said positive pulse is brought into a zero level except during said transmitting period, and vice versa;

wherein the detected output of said receiving signal is received by a receiving antenna and amplified by a Field Effect Transistor (FET) amplifier, and then detected by a diode direct detector and supplied to said video amplifier and, at the same time,

the transmission of the radar transponder is performed by a transmitting gate circuit for producing a transmitting gate pulse based on the output pulse from said control circuit and supplying the transmitting pulse to a receiving on-off switch, a sweep signal generator, and a microwave oscillator,

said sweep signal generator for receiving said transmitting gate pulse producing a required number of saw-tooth wave signals using the pulse, and supplying them to said microwave oscillator,

said microwave oscillator for making a microwave oscillate only during a finite time interval using said transmitting gate pulse and radiating a transmitting signal through a transmitting antenna while varying the oscillation frequency within the rated frequency range in accordance with the voltage value of said sawtooth wave signal to sweep the frequency, and

a receiving on-off switch for making zero an output level of a receiving signal applied to said FET amplifier by said transmitting gate pulse and stopping the operation of said FET amplifier only during the period corresponding to the width of the receiving gate pulse concerned.

4,885,589

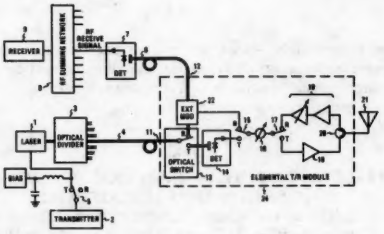
OPTICAL DISTRIBUTION OF TRANSMITTER SIGNALS AND ANTENNA RETURNS IN A PHASED ARRAY RADAR SYSTEM

Brian J. Edward, Jamesville, and Stephen Wanuga, Liverpool, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Sep. 14, 1988, Ser. No. 244,162

Int. Cl.[4] G01S *13/00*; H01Q *3/34*

U.S. Cl. 342—175 **6 Claims**



1. A T/R module for an associated antenna element for use in a phased array radar apparatus having a transmitter and a receiver, said module comprising:

(A) a fiber optics input port for receipt of an optical carrier modulated by transmitter signals during the transmit period and unmodulated during the receive period,

(B) a fiber optics output port for supplying antenna signals modulating an optical carrier to a receiver during the receive period,

(C) a directional optical single pole double throw (SPDT) switch having a common port, a port selected during the receive period and a port selected during the transmit period, the common port being coupled to said fiber optics input port,

(D) an optical detector having its input coupled to the transmit port of said optical SPDT switch for recovering the transmitter signal from the optical carrier,

(E) a power amplifier coupled to the output of said optical detector for amplifying the transmitter signal to a level suitable for application to the

(F) a low noise amplifier for amplifying the signal received by the associated antenna element to a level suitable for subsequent processing,

(G) means to couple said power amplifier to the associated antenna element during the transmit period, and to couple said associated antenna element to said low noise amplifier during the receive period, and

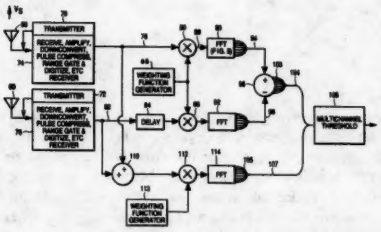
(H) an optical modulator coupled to the receive output of said optical switch for receipt of the unmodulated optical carrier during the receive period, a modulating input coupled to the output of said low noise amplifier for modulating said optical carrier with said antenna signal, the optical carrier, modulated by said antenna signal, being coupled to said optical output port.

4,885,590

BLIND SPEED ELIMINATION FOR DUAL DISPLACED PHASE CENTER ANTENNA RADAR PROCESSOR MOUNTED ON A MOVING PLATFORM

Moh'd A. Hasan, Cinnaminson Township, Burlington County, N.J., assignor to General Electric Company, Moorestown, N.J.

Filed Apr. 14, 1989, Ser. No. 339,563
Int. Cl.[4] G01S *13/00*
U.S. Cl. 342—196 10 Claims



1. A method for processing first and second signals, defining at least one wavelength and received at different times by first and second mutually displaced antennas carried on a vehicle movable relative to terrain, said first and second signals together defining a pulse recurrence interval, which signals include components representing returns from said terrain which are modified by Doppler components resulting from motion of said vehicle, comprising the steps of:

multiplying each of said first and second signals by a first weighting signal for reducing frequency sidelobes attributable to the pulsatory return of said first and second signals to produce first and second weighted signals;

dividing said first weighted signals into frequency components lying within a plurality of predetermined first frequency bands to produce first spectral band signals;

dividing said second weighted signals into frequency components lying within said plurality of predetermined first frequency bands to produce delayed second spectral band signals which are delayed relative to said first spectral band signals;

taking the difference between said first spectral band signals and said delayed second spectral band signals to produce MTI signals, in which the effects of said motion of said vehicle on said returns from said terrain are reduced to thereby relatively enhance returns from moving targets, but reducing the effective amplitude of said returns from those of said moving targets having radial velocities within certain limits;

summing said first and second signals to produce second sum signals;

multiplying said second sum signals by second weighting signals for reducing frequency sidelobes attributable to the pulsatory nature of said first and second signals, thereby producing third weighted signals; and

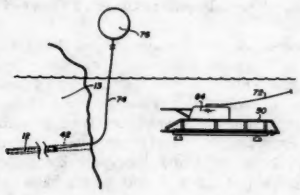
dividing said third weighted signals into frequency components lying within predetermined second frequency bands, at least most of which are higher in frequency than the highest of said predetermined first frequency bands.

4,885,591

METHOD AND APPARATUS FOR MONITORING ICE MASSES

Ronald D. Page, Newfoundland, Canada, assignor to Mobil Oil Corp., New York, N.Y.

Filed Sep. 28, 1983, Ser. No. 536,800
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] G01S *3/02, 13/93*
U.S. Cl. 342—450 13 Claims



1. A system for monitoring an iceberg comprising:

an anchor means for providing an attachment point to the iceberg having

an elongated hollow housing having a deployment end and a drill end;

an annular drill head rotatably mounted on said drill end of said housing;

a pressure means fixed to said drill head for providing pressurized fluid from said drill head to the iceberg, said pressure means including pressure jets mounted on said drill head;

a movement means for advancing said elongated housing into the iceberg; and

a freezing means for freezing said anchor means to said iceberg;

a flotation means connected to said anchor means for providing a detachable housing associated with the iceberg; and

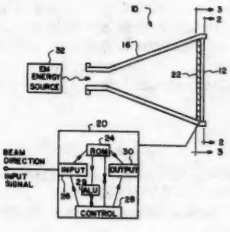
an identification means attached to said flotation means for providing location identification for the iceberg.

4,885,592

ELECTRONICALLY STEERABLE ANTENNA

J. Stephen Kofol, 665 Roble Ave., Apt C, Menlo Park, Calif. 94025, and Daniel A. Schroepfer, 2857 Flag Ave. N., Apt. 1G, New Hope, Minn. 55427

Filed Dec. 28, 1987, Ser. No. 138,409
Int. Cl.[4] H01Q *13/10*
U.S. Cl. 343—754 9 Claims



1. An electronically steerable antenna comprising:

an array of slot-type radiators in a conductive member mounted on a phase plate of varying thickness, wherein the proximate thickness determines a phase for each of

said slot-type radiators, wherein each of said slot-type radiators has an independently adjustable output amplitude and a particular fixed phase, and wherein each of said slot-type radiators has a base-emitter junction of a planar bipolar transistor that determines the impedance of each of said slot-type radiators according to a control voltage applied across the junction, thereby determining an amplitude of output radiation from each of said slot-type radiators;

an electromagnetic radiation energy source, coupled to said array of slot-type radiators, for providing electromagnetic radiation through the phase plate to said array of slot-type radiators;

control means, connected to said array of slot-type radiators, for controlling each of said slot-type radiators by applying the control voltage across the junction of each bipolar transistor of each of said radiators; and

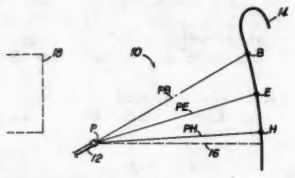
antenna programming means, connected to said control means, for indicating to said control means the amplitudes of output radiation of said slot-type radiators that form a group pattern of selected slots which have determined impedances and individual fixed phases, wherein the group pattern of selected slots has a cumulative effect of rapidly establishing a particular resultant radiated pattern for a certain direction and distance (for instance, near- or far-field) at a particular frequency.

4,885,593

FEEDS FOR COMPACT RANGES

Doren W. Hess, Jr., Norcross, and John R. Jones, Lawrenceville, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Sep. 18, 1986, Ser. No. 908,996
Int. Cl.[4] H01Q *13/00*
U.S. Cl. 343—786 **8 Claims**



1. A method of illuminating a compact range with energy in a predetermined bandwidth using a waveguide feed, comprising the steps of:

(a) selecting the bandwidth of energy for operation of the range, the bandwidth having a lowest frequency of operation f_o;

(b) selecting an open-ended non-ridged round waveguide feed whose radius defines a cutoff frequency f_c in the TE_{11} mode of substantially $f_o/1.008$;

(c) installing the feed on the range; and

(d) supplying the feed with energy whose frequency is between f_o and $1.26f_c$.

4,885,594

RECORDING APPARATUS WITH POSITION DEPENDENT PULSE MODULATION

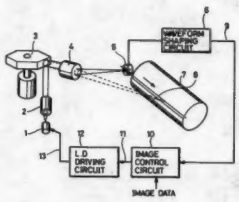
Tatsuya Eguchi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 3, 1988, Ser. No. 151,811
Claims priority, application Japan, Feb. 3, 1987, 62-23146
Int. Cl.[4] G01D *9/42, 15/14*
U.S. Cl. 346—108 **20 Claims**

1. A recording apparatus in which a laser beam with its pulse modulated corresponding to image data scans an objective plane by a deflection device, comprising:

means for providing a constant speed scanning of the laser beam on a recording surface;

position signal output means for outputting a position signal corresponding to the position of said laser beam on a scanning line of said recording surface, and



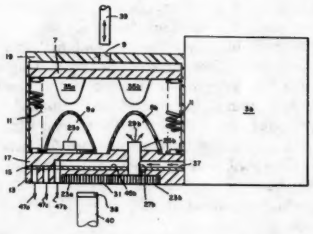
duty cycle changing means for changing in response to said position signal the duty cycle of the pulse modulation which responds to the image data, so that an on or off period width of the pulse modulation during each cycle becomes smaller at an end portion of said scanning line than at the central portion of the scanning line whereby uniform width image dots are formed across the entire scanning line of said recording surface.

4,885,595

MULTICOMPONENT REFILLABLE TONER DELIVERY SYSTEM

George Kaplinsky, and Ross R. Allen, both of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 14, 1989, Ser. No. 311,017
Int. Cl.[4] G01G *15/18*
U.S. Cl. 346—140 R **12 Claims**



1. A liquid delivery system for an ink-jet printer, said system having refillable bladders having in combination:

(a) multiple reservoirs for storing quantities of different liquids;

(b) a printhead capable of delivering separately each of said different liquids to a printing medium;

(c) a bladder for each of said different liquids for providing a supply of said liquid at a known back pressure to predetermined jets in a printhead;

(d) a valve associated with each bladder and an inlet means and an outlet means for providing a closed mode, a refill mode for conveying liquid from a reservoir to said bladder, and a print mode for conveying said liquid from said bladder to said printhead; and

(e) support means for maintaining said reservoirs, said printhead, said bladders, and said valves in cooperative association.

4,885,596

RECORDING APPARATUS

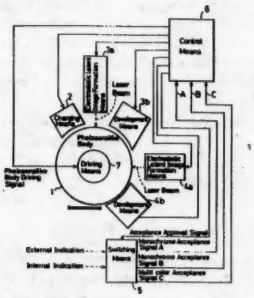
Jiro Egawa; Naruhito Yoshida; Toshihiro Kasai; Moriya Nagasawa, all of Kanagawa; Naoaki Ide, and Hironobu Machida, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 9,349, Jan. 30, 1987. This application Aug. 15, 1988, Ser. No. 232,281

Claims priority, application Japan, Jan. 31, 1986, 61-18235

Int. Cl.[4] G03G *15/00*

U.S. Cl. 346—157 4 Claims



1. An image forming apparatus, comprising:

means for forming an image in accordance with a plurality of dot signals;

means for providing a clock signal for sending the dot signals synchronous with the clock signal;

means for receiving the clock signal provided by said clock signal providing means; and

means for sending image signals corresponding to said.

4,885,597

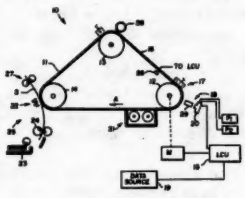
NON-IMPACT PRINTER APPARATUS WITH IMPROVED CURRENT MIRROR DRIVER AND METHOD OF PRINTING

Pin S. Tschang, Rochester; Hieu T. Pham, Webster, and Kenneth D. Kieffer, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,012

Int. Cl.[4] G01D *15/00*

U.S. Cl. 364—519 24 Claims



1. In a printing apparatus for exposing a radiation sensitive recording medium; a print head including a series of point-like radiation sources arranged in a row for exposing the medium, means for moving the medium relative to the print head; means providing data signals representing data to be printed; logic means responsive to the data signals for determining which of the point-like radiation sources are to be selected for energization; current driver means responsive to the logic means for providing electrical current to the radiation sources selected for energization;

wherein the current driver means includes a current mirror having a master circuit for generating a reference current and a plurality of slave circuits for providing respective driver currents to the radiation sources selected for energization; the master circuit being characterized by a plurality of individually addressable current regulating devices; and digital control means for digitally addressing each such current regulating device to control the level of current in the master circuit.

4,885,598

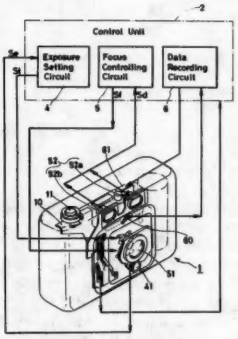
CAMERA HAVING DATA RECORDING FUNCTION

Isao Shibata, Yamanashi, Japan, assignor to Nippon Seimitsu Kogyo Kabushiki Kaisha, Kofu, Japan

Filed Dec. 31, 1987, Ser. No. 140,212

Int. Cl.[4] G03B *17/24*

U.S. Cl. 354—106 4 Claims



1. A camera having a function of data recording, comprising:

a release lever which brings about a shutter releasing state when being pressed to a trigger point;

focus control means for effecting measurement of a distance from a lens system of the camera to a subject to be photographed and actuating the lens system in accordance with the measured distance to the subject so as to focus the lens system on the subject in the shutter releasing state;

exposure control means for effecting measurement of brightness of the subject and determining an aperture in size formed in a shutter in accordance with the measured brightness of the subject in the shutter releasing state;

a shutter operating member which moves from its rest position to its charge position while a film winding is effected and returns from the charge position to the rest position in the shutter releasing state;

a shutter driving member for opening and closing the shutter after completing the measurement of the distance effected by said focus control means and the measurement of the brightness effected by said exposure control means in the shutter releasing state;

program switch means including a slide electric collector and a contact pattern which are slidably moved relative to each other with said shutter operating members, one of said slide electric collector and a contact pattern being formed on said shutter operating member so as to perform a switching action in conjunction with said shutter operating member so as to output a data recording signal while said shutter operating member returns from the charge position to the rest position in the shutter releasing state; and

data printing means for printing required data on a film loaded in the camera in response to the data recording

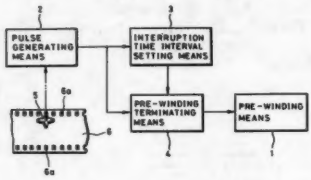
signal output from the program switch means in shutter releasing.

4,885,599

PRE-WINDING CONTROL DEVICE FOR A CAMERA

Shigenori Goto, and Fumio Iwai, both of Omiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 10, 1988, Ser. No. 204,867
Claims priority, application Japan, Jun. 10, 1987, 62-144903
Int. Cl.[4] G03B *1/12*
U.S. Cl. 354—173.11 **9 Claims**



1. A pre-winding control device used in a photographic camera of the type having means for sensing film advancement of a predetermined length of a filmstrip, drive means for pre-winding all available frames of the filmstrip onto a film take-up spool before making exposures and rewinding it one frame for every exposure, and means for generating pulse signals, one for every predetermined length of advancement of the filmstrip detected, said pre-winding control device comprising:

means for detecting pulse generating time intervals at which said pulse signals are generated;

means for setting and updating an interruption time interval for which said drive means is interrupted for each film-strip winding operation, said interruption time interval being a function of a predetermined number of said pulse generating time intervals detected by said detecting means; and

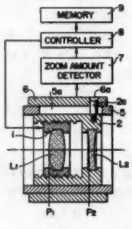
means for disabling said drive means when said pulse signal generating means generates no pulse signals for said inter-ruption time interval.

4,885,600

ZOOM MECHANISM FOR A ZOOM LENS IN CAMERAS AND THE LIKE

Kazuyuki Iwasa, Mitaka, and Hirotsugu Nakazawa, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 7, 1988, Ser. No. 164,568
Claims priority, application Japan, Mar. 10, 1987, 62-54884
Int. Cl.[4] G03B *3/10, 5/00*; G02B *7/02, 15/00*
U.S. Cl. 354—400 **7 Claims**



1. A zoom mechanism for a zoom lens in a camera and the like, comprising:

said zoom lens having a predetermined optical axis;

a frame for holding a zoom system lens composed of at least one frame for changing its focal length by moving said frame in a direction of the optical axis;

a frame for holding a focus system lens which frame moves together with said zoom system lens holding frame during a zooming operation and is held in the latter so as to be movable in a direcion of the optical axis duing a focusing operation;

detector means for detecting movement of said zoom system lens holding frame from a predetermined position;

memory means for storing a difference in position of said focus system lens holding frame from its normal position in relation to movement of said zoom system lens holding frame from said predetermined position as an amount of correction and for delivering a stored value corresponding to movement of said zoom lens holding frame from said predetermined position which movement is detected by said detector means; and

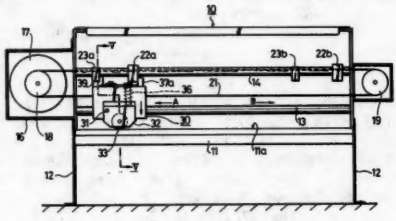
controller means for moving said focus system lens holding frame in relation to said zoom system lens holding frame in a direction of the optical axis in accordance with an output of said memory means.

4,885,601

APPARATUS FOR DEVELOPING IMAGING SHEETS EMPLOYING PHOTOSENSITIVE MICROCAPSULES

Yasuji Yui, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,373
Claims priority, application Japan, Oct. 27, 1987, 62-270758
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—27 **14 Claims**



1. An apparatus for developing a picture on a sheet of developing paper from a photo-sensitive sheet of a type which develops said picture upon the pressing together of said sheet of developing paper and said photo-sensitive sheet, said apparatus comprising:

means defining a back-up surface;

means for transporting said sheet of developing paper and said photo-sensitive sheet in contact with each other in a predetermined direction of sheet travel across said back-up surface;

a rotatable roller disposed in opposing relation to said back-up surface and having an axis of rotation extending parallel to said predetermined direction of sheet travel;

means mounting said roller for bodily movements toward and away from said back-up surface and parallel to the back-up surface in directions perpendicular to said predetermined direction of sheet travel; and

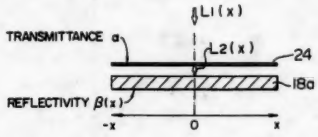
means for transporting said roller relative to said back-up surface in one of said directions perpendicular to said predetermined direction of sheet travel while urging said roller toward said back-up surface with said sheet of developing paper and said photo-sensitive sheet being in contact with each other between said roller and back-up surface so as to be pressed together thereby.

4,885,602

EXPOSURE SYSTEM FOR PHOTO-SENSITIVE RECORDING MEDIUM

Kawahara Hiroshi, Nishikasugai, and Sakakibara Kenji, Ichinomiya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 28, 1988, Ser. No. 264,149
Claims priority, application Japan, Oct. 30, 1987, 62-167112[U]
Int. Cl.[4] G03B 27/32
U.S. Cl. 355—27 13 Claims



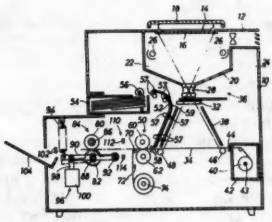
1. An exposure system for a photo-sensitive recording medium, which comprises light source means for emitting light and table means having a resting surface on which the recording medium rests, wherein the recording medium on said resting surface of said table means is illuminated with the light from said light source means and is exposed to the light, and wherein said resting surface of said table means has reflectivity which is so determined as to increase from a central region of said resting surface gradually toward opposite end regions thereof in such a manner that a sum of a quantity of the light from said light source means, with which the recording medium is illuminated directly, and a quantity of light transmitted through the recording medium and reflected by said resting surface of said table means, with which the recording medium is illuminated indirectly, is made substantially uniform over an entire surface of the recording medium.

4,885,603

IMAGE RECORDING APPARATUS FOR PRODUCING GLOSSY IMAGE MEDIUM

Takashi Tomizawa, Aichi, and Osamu Takagi, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 28, 1988, Ser. No. 172,800
Claims priority, application Japan, Apr. 2, 1987, 62-5035[U]
Int. Cl.[4] G03B 27/52
U.S. Cl. 355—30 6 Claims



1. An image recording apparatus comprising an image recording section and a glossing section for furnishing an image medium with glosses by means of heat, the glossing section comprising:

a heating device for heating the image medium;

a feeding device for feeding the image medium;

a contacting means for urging one of the heating device and the feeding device against the other and for separating one from the other; and

an arm for supporting the urged and separated device;

wherein the contacting means is provided at one end of the arm so that the contacting means applies force to one end of the arm while the other end serves as a point of support; and

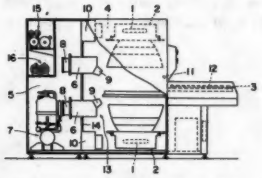
wherein the urged and separated device is mounted between the two ends of the arm.

4,885,604

EXPOSURE APPARATUS

Nobuo Adachi, Kawasaki, and Shinya Ogawa, Chofu, both of Japan, assignors to Orc Manufacturing Co., Ltd., Japan

Filed Sep. 1, 1988, Ser. No. 238,774
Claims priority, application Japan, Jun. 3, 1988, 63-73970[U]
Int. Cl.[4] G03B 27/52
U.S. Cl. 355—30 4 Claims



1. In an exposure apparatus having a light source of an ultra-violet lamp and mirror situated in an exposure room of an overall housing, and a circuit board supporting tray moveable in and out of said exposure room, the improvement comprising:

a cooling room within said housing and separated from said exposure room by a common wall;

cooling means, extending through said common wall, for cooling said tray and a circuit board mounted thereon, said cooling means comprising a refrigeration unit and a fan and radiator for cooling air and circulating cooled air from said cooling room into said exposure room; and

blow mouth means for directing said cooled air directly onto at least one surface of said tray.

4,885,605

NEGATIVE/POSITIVE MICROFILM DISCRIMINATING SYSTEM

Masafumi Fujita; Yasushi Yamade, and Takao Saijo, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 155,844, Feb. 12, 1988, abandoned.
This application Mar. 28, 1989, Ser. No. 331,059
Claims priority, application Japan, Feb. 13, 1987, 62-31883; Feb. 13, 1987, 62-31884; Feb. 13, 1987, 62-31885
Int. Cl.[4] G03B 27/52
U.S. Cl. 355—41 16 Claims

1. A negative-positive microfilm discriminating system for use in a microfilm handling apparatus comprising

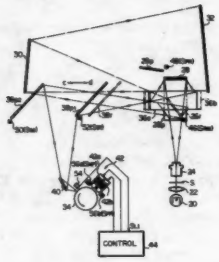
(a) light projecting means for projecting a beam of light bearing an image detected from a microfilm strip,

(b) density detecting means disposed in the path of light from said light projecting means for detecting the densities in each of a plurality of blocks of a patterned image zone of said microfilm strip,

(c) block selecting means for selecting out of said blocks the blocks having acceptable degrees of contrast,

(d) negative/positive discriminating means for determining

whether the image zone within each of the selected blocks is a negative or is a positive, and



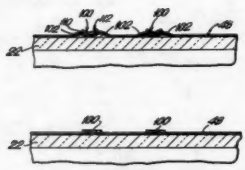
(e) decision means responsive to the results of determination by said discriminating means for determining whether said microfilm strip is a negative or is a positive.

4,885,606

VACUUM TRANSPORT AND HOLD DOWN BELT FOR AUTOMATIC CAMERA

Daniel H. Robbins, Rochester, N.Y., assignor to Itek Graphix Corp., Waltham, Mass.

Filed Jun. 29, 1988, Ser. No. 212,948
Int. Cl.[4] G03B 27/60
U.S. Cl. 355—73 24 Claims



1. In a camera including a supply of photosensitive material, a platen to receive the photosensitive material, a vacuum feed and hold down system including a transport belt held down by vacuum against the platen for exposure, and an optical system to expose the photosensitive material, the improvement comprising:

a movable flexible opaque transport belt disposed substantially parallel to the platen, said transport belt having a top belt surface away from the platen and a bottom belt surface facing the platen; and

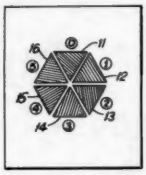
at least one resilient belt flexing member adhered to said top belt surface, said belt flexing member assuming a first position creating at least one air channel underneath said belt when said belt is not subject to vacuum hold down, said resilient belt flexing member assuming a second, flexed position substantially parallel to the platen during vacuum hold down, said bottom belt surface pressing against the platen when said resilient belt flexing member assumes said second position, thereby providing a substantially flat background surface during exposure.

4,885,607

METHOD AND DEVICE FOR SELECTING THE APPROPRIATE CONTRAST GRADE PHOTOGRAPHIC FOR PRINTING A BLACK AND WHITE TRANSPARENCY

Thomas F. Farb, Horizon Hill, P.O. Box 65, Lincoln Center, Mass. 01733

Continuation of Ser. No. 85,584, Aug. 14, 1987, abandoned. This application Sep. 14, 1988, Ser. No. 245,993
Int. Cl.[4] G03B 27/72
U.S. Cl. 355—71 5 Claims



1. A device for selecting a contrast grade of paper or variable-contrast filter for printing a black and white negative, comprising:

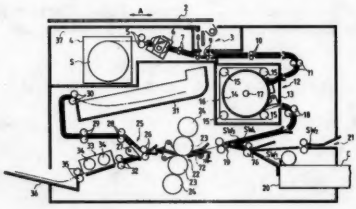
a clear substrate having a plurality of sections, each having a different color equivalent to a different variable-contrast filter grade and each having approximately the same density, adjusted for the speed of the emulsions of the variable-contrast paper.

4,885,608

PICTURE RECORDING APPARATUS

Yoshiharu Okino, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 25, 1988, Ser. No. 236,409
Claims priority, application Japan, Aug. 25, 1987, 62-209139
Int. Cl.[4] G03B 27/30
U.S. Cl. 355—107 6 Claims



1. A picture recording apparatus whose operation includes a step of superimposing two kinds of picture forming materials, said picture recording apparatus comprising:

a pair of forward end detection means disposed respectively along conveying paths of said picture forming materials immediately before a position where said picture forming materials are superimposed on one another for detecting respective forward ends of said picture forming materials; and

superimposition control means which is responsive to a detection signal from one of said pair of forward end detection means for one of said picture forming materials to stop conveyance of said one picture forming material and which is responsive to a detection signal from the other of said pair of forward end detection means for the other picture forming material to control re-conveyance of said one picture forming material at a desired timing to effect correct superposition between said picture forming materials.

4,885,609

AUTOMATIC IMAGE DUPLICATING APPARATUS

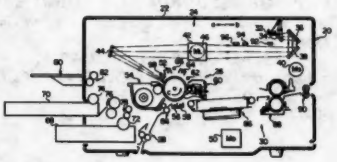
Syuzi Maruta, and Masazumi Ito, both of Aichi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

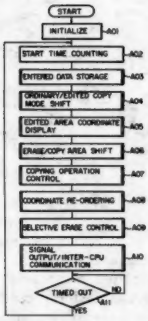
Filed Nov. 30, 1987, Ser. No. 126,425

Claims priority, application Japan, Dec. 1, 1986, 61-286216; Jan. 26, 1987, 62-15875

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—202 15 Claims





1. An image duplicating apparatus comprising.

(a) a main body including:

copying means capable of copying images on a desired area of a document,

first input means for entering data designating said desired area of the document, and

memory means for storing the data entered by said first input means,

(b) an additional device connectable to said main body and comprising second input means for entering data designating said desired area of the document,

(c) first control means for controlling said copying means on the basis of the data stored in said memory means, and

(d) second control means for controlling said copying means on the basis of the data entered by said second input means when data is entered from said second input means with data stored in said memory means.

4,885,610

DEVICE FOR FEEDING ORIGINALS TO A COPYING MACHINE

Kazuyuki Katoh, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 11, 1987, Ser. No. 131,925

Claims priority, application Japan, Dec. 15, 1986, 61-191743[U]

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—233 7 Claims

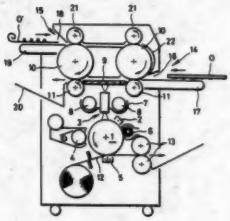
1. A copying machine comprising:

a light exposure device having a stationary light source adapted to illuminate an original to be copied,

a photo-sensitive member adapted to form an electrostatic latent image through exposure by a light exposure device,

a first insertion port with an insertion table adapted to insert an original to be copied,

a first transfer means adapted to feed the original to be copied inserted from the first insertion inlet directly to the position of discharging the same through the position of exposure,



a second insertion port with an insertion table adapted to insert an original to be copied, and

a second transfer means adapted to feed said original fed from said second insertion port by reversing the same by 180 degrees to the exposure position as well as to the position of discharging the same.

4,885,611

MULTICOLOR IMAGE FORMING APPARATUS

Kimihiko Higashio, and Kadotaro Nishimori, both of Osaka, Japan, assignors to Minolta Camera Kabushika Kaisha, Osaka, Japan

Filed Feb. 22, 1988, Ser. No. 158,940

Claims priority, application Japan, Feb. 26, 1987, 62-44453

Int. Cl.[4] G03G *15/000, 15/01, 15/085*

U.S. Cl. 355—245 13 Claims

1. An image forming apparatus capable of forming a multicolor image, comprising:

a frame;

a photosensitive member provided on the frame;

a first developing unit removably mounted on the frame for developing a latent image formed over the surface of the photosensitive member by using a first color toner;

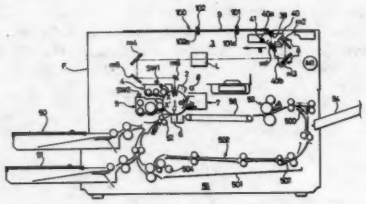
a second developing unit removably mounted on the frame for developing a latent image formed over the surface of the photosensitive member by using a second color toner;

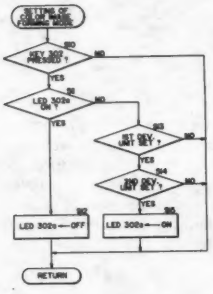
detecting means for detecting the positional condition of the first and second developing units;

image forming mode selecting means for selecting a desired image forming mode among a first image forming mode in which a single-color image is formed by operating one of said first developing unit and said second developing unit, and a second image forming mode in which a two-color image is formed by operating both said first developing unit and said second developing unit; and

control mean which enables selection of the second image forming mode when the appropriate disposition of both the first and second developing units on the frame is de-

tected by the detecting means, and inhibits selection of the second image forming mode when the appropriate disposition of only one of the first and second developing units is detected by the detecting means.





4,885,612

CLEANING DEVICE FOR AN IMAGE FORMING APPARATUS

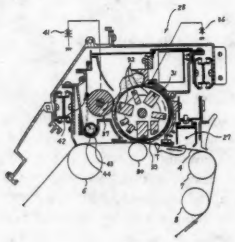
Tsumori Satoh, Yokosuka, and Yasushi Koichi, Yamato, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,863

Claims priority, application Japan, Oct. 8, 1987, 62-252413

Int. Cl.[4] G03G *21/0082*

U.S. Cl. 355—305 **10 Claims**



1. In a cleaning device for an image forming apparatus which develops an electrostatic latent image formed on an image carrier with toner to produce a toner image, transfers said toner image to a transfer material, and cleans said image carrier to remove toner remaining on said image carrier after the image transfer, said cleaning device comprising a carrier retaining member magnetically retaining carrier which forms a magnet brush and being located to face said image carrier such that said carrier attracts by an electric force the toner remaining on said image carrier, and voltage applying means for applying to said carrier retaining means a bias voltage which is opposite in polarity to a charge deposited on the remaining toner to be removed, the improvement wherein particles of the carrier which forms the magnet brush individually have volume resistivity of lower than 10^{10} Ω.cm while particles of the toner individually have a dielectric constant of smaller than 3.7.

4,885,613

DEVICE APPLICABLE TO AN IMAGE RECORDING APPARATUS FOR FEEDING A RECORDING MEDIUM

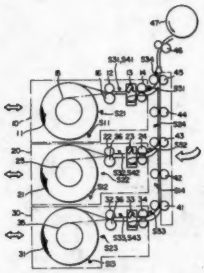
Kunio Kudoh, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 254,804

Claims priority, application Japan, Oct. 8, 1987, 62-254480

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—310 **4 Claims**



1. A device installed in an image recording apparatus for feeding a recording medium, comprising:

a plurality of recording medium feeding means each comprising kind sensing means responsive to a kind of a recording medium, remaining amount sensing means responsive to a remaining amount of said recording medium, pulling means for pulling a leading edge of said recording medium onto a predetermined transport path, and driving means for driving said pulling means; and

control means for controlling said recording medium feeding means such that any of said recording medium feeding means which is loaded with a recording medium of a kind specified beforehand is identified on the basis of outputs of said kind sensing means and, when a plurality of said recording medium feeding means are each loaded with said recording medium of said specified kind, one of said recording medium feeding means which has the largest amount of recording medium remaining therein is selected as recording medium feeding means for feeding a recording medium on the basis of outputs of said remaining amount sensing means which are individually associated with said plurality of recording medium feeding means.

4,885,614

SEMICONDUCTOR DEVICE WITH CRYSTALLINE SILICON-GERMANIUM-CARBON ALLOY

Seijiro Furukawa, Kawasaki; Hiroyuki Etoh, Kokubunji; Akitoshi Ishizaka, Kokubunji, and Toshikazu Shimada, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1988, Ser. No. 216,522

Claims priority, application Japan, Jul. 10, 1987, 62-170947

Int. Cl.[4] H01L *29/161*

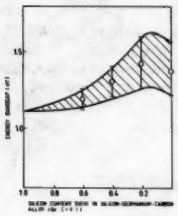
U.S. Cl. 357—16 **28 Claims**

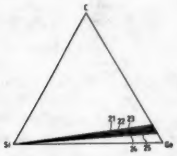
1. A semiconductor device comprising:

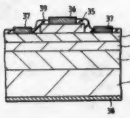
a first crystalline semiconductor layer being made mainly of silicon; and

a second single crystalline semiconductor layer made of

silicon-germanium-carbon semiconductor material, wherein the first and the second semiconductor layers







form a heterojunction therebetween, and wherein the atomic number ration of germanium/cabron in the second semiconductor layer is in the range of 6.7/1 to 12/1.

4,885,615

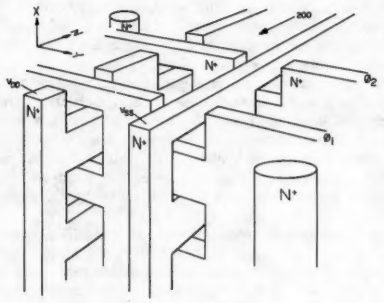
MONOCRYSTALLINE THREE-DIMENSIONAL INTEGRATED CIRCUIT

Raymond M. Warner, Jr., Edina; Ronald D. Schrimpf, St. Paul, both of Minn., and Alfons Tuszynski, San Diego, Calif., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation-in-part of Ser. No. 799,652, Nov. 19, 1985, Pat. No. 4,794,442. This application May 12, 1986, Ser. No. 861,708

Int. Cl.[4] H01L *29/80, 27/02, 27/12*

U.S. Cl. 357—22 **21 Claims**



1. Monocrystalline three-dimensional integrated circuit comprising:

a. plurality of monocrystalline semiconductor devices forming at least two layers of circuitry;

b. at least one component from the following group in at least one of said devices;

(1) region of lattice-matched monocrystalline metallic material as an ohmic contact,

(2) region of lattice-matched monocrystalline metallic material as an interconnecting conductor in said circuit,

(3) a lattice-matched monocrystalline insulator substantially surrounding said conductor,

(4) a lattice-matched monocrystalline insulator substantially surrounding at least one of said devices; and,

c. a lattice-matched monocrystalline matrix substantially surrounding the components of the monocrystalline three-dimensional integrated circuit.

4,885,616

THIN FILM DISPLAY DEVICE WITH THIN AMORPHOUS CHANNEL

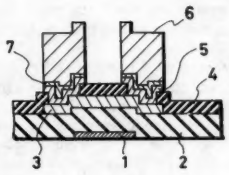
Masahiko Ohta, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

Continuation of Ser. No. 783,764, Oct. 3, 1985. This application Aug. 21, 1987, Ser. No. 88,528

Claims priority, application Japan, Oct. 9, 1984, 59-211671

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.7 **8 Claims**



1. In a thin film display device having a liquid crystal panel and a picture element selective transistor formed on a substrate, said picture element selective transistor comprising:

a gate region formed on the substrate;

a first insulating layer formed on the gate region and the substrate;

a channel region layer composed of an undoped amorphous silicon single layer and having a thickness less than 1000 Å, the channel region layer being formed on the first insulating layer;

a second insulating layer formed on the channel region layer and the first insulating layer, the second insulating layer being partially removed for exposing spaced-apart top parts of the channel region layer;

a semi-conductive layer selectively formed on the exposed top parts of the channel region layer to define source and drain regions; and

electrodes formed on the semi-conductive layer.

4,885,617

METAL-OXIDE SEMICONDUCTOR (MOS) FIELD EFFECT TRANSISTOR HAVING EXTREMELY SHALLOW SOURCE/DRAIN ZONES AND SILICIDE TERMINAL ZONES, AND A PROCESS FOR PRODUCING THE TRANSISTOR CIRCUIT

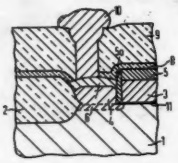
C. A. Mazure-Espejo, Kirchseon, and Franz Neppl, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

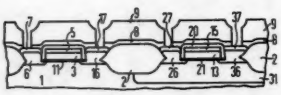
Filed Oct. 21, 1987, Ser. No. 110,885

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639356

Int. Cl.[4] H01L *29/78, 27/02, 23/48*

U.S. Cl. 357—23.9 5 Claims





1. A metal-oxide-semiconductor field effect transistor structure, comprising:

a substrate having a source zone and a drain zone therein at a surface thereof;

an insulating layer on the substrate between the source and drain zones, and a gate electrode on the insulating layer;

a sidewall oxide layer covering each side of the gate electrode adjacent one side of the source and drain zones, respectively;

a field oxide zone in and extending above the substrate at a side opposite said one side of each of the source and drain zones;

directly above each of the source and drain zones and between and in contact with the gate electrode side oxide layers and the respective field oxide zones a grown monocrystalline doped silicon epitaxial layer being provided serving as a diffusion source from which the respective source or drain zones directly beneath are produced; and

respective silicide source and drain terminal layers directly overlying and in contact with the respective silicon epitaxial layers, said terminal layers being laterally limited at one side by the respective gate sidewall oxide and at the other side by the respective field oxide zone so that the terminal layers are self-aligned.

4,885,618

INSULATED GATE FET HAVING A BURIED INSULATING BARRIER

Peter J. Schubert, Greentown, Ind., and Robert J. Wallace, Southfield, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 843,285, Mar. 24, 1986, abandoned. This application Aug. 25, 1987, Ser. No. 89,485

Int. Cl.[4] H01L *29/78*

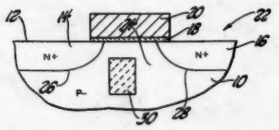
U.S. Cl. 357—23.11 2 Claims

1. An insulated gate field effect transistor device having means for significantly increasing punch-through voltage, comprising:

a substrate of a first conductivity type;

a source region of a second conductivity type formed in the substrate;

a drain region of the second conductivity type formed in the substrate in spaced relation with the source region to define a channel region of predetermined thickness between the source and drain regions, the thickness of the channel region being between the substrate surface and the innermost plane within the substrate which is able to intersect the source and drain regions, said innermost plane is disposed in a direction extending from and generally parallel to said substrate surface;



a gate dielectric and gate electrode structure on the substrate surface, operable to produce an electric field in the channel region when a voltage is applied thereto; and

an insulating barrier buried in the substrate, said insulating barrier being substantially planar and disposed perpendicularly to said substrate surface, and having at least a portion extending into at least the majority of the channel thickness toward said substrate surface from below said innermost plane within said substrate, but not intersecting said substrate surface.

4,885,619

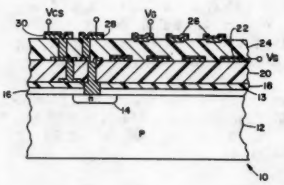
HGCDTE MIS DEVICE HAVING A CDTE HETEROJUNCTION

Kenneth Kosai, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Continuation of Ser. No. 88,330, Aug. 24, 1987, abandoned. This application May 16, 1989, Ser. No. 355,064

Int. Cl.[4] H01L *29/78, 29/34, 29/04*

U.S. Cl. 357—24 10 Claims



1. A metal-insulated-semiconductor device comprising:

a substrate comprised of semiconductor material having a first crystalline structure and further having a first type of electrical conductivity;

a layer of passivation overlying at least one surface of said substrate, said passivation layer being comprised of an epitaxial layer of Group II-VI material having a second crystalline structure which is substantially crystallographically continuous and substantially lattice matched with said first crystalline structure, an energy bandgap of said passivation layer being wider than an energy bandgap of said substrate;

at least one region having a second type of electrical conductivity disposed within a surface region of said substrate for forming a p-n diode junction, said region having the second type of electrical conductivity being disposed at least partly beneath said passivation layer;

a first layer of electrical insulator material overlying said passivation layer;

a first plurality of spaced apart gate electrodes disposed upon said first electrical insulator layer;

a second layer of electrical insulator material overlying said first layer of electrical insulator material and said first plurality of gate electrodes; and

a second plurality of spaced apart gate electrodes disposed upon a top surface of said second electrical insulator layer.

4,885,620

SEMICONDUCTOR ELEMENT

Josef Kemmer, Hauptstr. 41 D, 8048 Haimhausen, and Gerhard Lutz, Therese-Giese-Allee 23, 8000 Munchen 83, both of Fed. Rep. of Germany

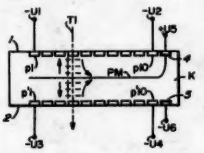
PCT No. PCT/DE85/00133, § 371 Date Feb. 24, 1986, § 102(e) Date Feb. 24, 1986, PCT Pub. No. WO85/04986, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 25, 1985, Ser. No. 828,322

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1984, 3415426; Apr. 25, 1984, 3415443; May 19, 1984, 3418778; Jul. 25, 1984, 3427476

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—24 40 Claims



1. Semiconductor element comprising:

a basic region;

biasing means for applying a bias to at least one limiting surface of the basic region which completely depletes the basic region of majority carriers and produces a potential minimum in the basic region for the majority carriers in which the majority carriers are collected and moved;

majority sensor means for sensing a characteristic of majority carriers; and

first minority sensor means, operable simultaneously with said majority sensor means for sensing at least one of the following: the quantity, movement direction and speed of the minority carriers controlled by the path of the potential minimum on at least one side of the potential minimum.

4,885,621

MONOLITHIC PRESSURE SENSITIVE INTEGRATED CIRCUIT

Douglas J. Yoder, Sharpsville; Ronald E. Brown, Kokomo; Paul E. Stevenson, Kokomo; Donald L. Hornback, Kokomo, and Ronald K. Leisure, Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed May 2, 1988, Ser. No. 189,446

Int. Cl.[4] H01L *29/84, 29/96*

U.S. Cl. 357—26 6 Claims

1. A monolithic pressure sensitive integrated circuit comprising a monocrystalline silicon chip including:

a bulk portion of relatively high resistivity having opposed major surfaces and including at its back surface a square cavity for forming a thinned region in the bulk portion;

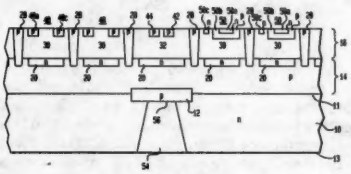
an etch stop region of low resistivity on the front surface of said bulk portion for defining the depth of the cavity, said etch stop region forming the bottom of said cavity;

a first epitaxial layer on said front surface of said bulk portion, said first epitaxial layer having an outer face, an inner face, and a higher resistivity adjacent its inner face for isolating said etch stop region from a second epitaxial layer overlying said first epitaxial layer;

said second epitaxial layer being of a conductivity type opposite from said first epitaxial layer and being disposed on said outer face of said first epitaxial layer, said second epitaxial layer having inner and outer surfaces;

at least one region, of a conductivity type the same as the second epitaxial layer and of lower resistivity than said second epitaxial layer, disposed between and extending into said first and second epitaxial layers, effective to provide a low resistance region buried under said second epitaxial layer;

at least one region, of a conductivity type opposite to that of the second epitaxial layer and of lower resistivity than said first epitaxial layer, disposed between and extending into said first and second epitaxial layers, effective to provide a buried part of a p-n junction isolation wall extending up into the said second epitaxial layer from the inner surface of said second epitaxial layer;



at least one region, of a conductivity type opposite to that of the second epitaxial layer, on the outer surface of said second epitaxial layer and registered over said buried part of the isolation wall, effective to cooperate with said buried part and thereby provide a p-n junction isolation wall completely through the thickness of said second epitaxial layer;

a plurality of piezoresistors on the front surface of said second epitaxial layer disposed over said cavity;

additional regions in said second epitaxial layer providing at least two additional electrical components in said second epitaxial layer, said components being disposed on opposite sides of said p-n junction isolation wall; and

a patterned conductor layer overlying said outer surface of said second epitaxial layer and making selective contact with said regions and piezoresistors, effective to interconnect said piezoresistors with said electrical components to form a monolithic pressure sensitive integrated circuit.

4,885,622

PIN PHOTODIODE AND METHOD OF FABRICATION OF THE SAME

Akira Uchiyama; Yuuichi Masaki; Toshiyuki Iwabuchi; Tsutomu Nomoto, and Masaaki Sakamoto, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 714,493, Mar. 21, 1985, abandoned. This application Jun. 6, 1988, Ser. No. 204,942

Claims priority, application Japan, Mar. 23, 1984, 59-55768; Apr. 4, 1984, 59-87182; May 2, 1984, 59-89072; May 2, 1984, 59-89074; Nov. 8, 1984, 59-234066

Int. Cl.[4] H01L *27/14*

U.S. Cl. 357—30 4 Claims

1. A PIN photodiode comprising;

(a) a substrate formed of a radiation-transmissive material;

(b) a lower electrode conductive layer of a radiation-transmissive material deposited on one surface of said substrate;

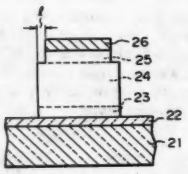
(c) a first conductivity-type layer of amorphous semiconductor deposited on a portion of one surface of said lower electrode conductive layer opposite to a surface thereof facing said substrate;

(d) an intermediate layer of intrinsic amorphous semicon-

ductor deposited on all of one surface of said first conductivity-type layer opposite to a surface thereof facing said lower electrode conductive layer;

(e) a second conductivity-type layer of amorphous semiconductor deposited on a portion of one surface of said intermediate layer opposite to a surface thereof facing said first conductivity-type layer such that opposed lateral edges of said second conductivity-type layer are located inwardly of opposed lateral edges of said intermediate layer;

(f) an upper electrode conductive layer deposited on all of a surface of said second conductivity-type layer opposite to



a surface thereof facing said intermediate layer, said second conductivity-type layer and said upper electrode conductive layer being separated into a plurality of sections by insulative regions which extend into said intermediate layer thereby dividing said second conductivity-type layer and said upper electrode conductive layer into said plurality of sections; and

(g) an insulative protective film covering at least a portion of a surface of said upper electrode conductive layer opposite to a surface thereof facing said second conductivity-type layer.

4,885,623

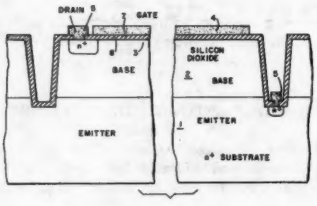
DISTRIBUTED CHANNEL-BIPOLAR DEVICE

James W. Holm-Kennedy, 3215 Pacific Hts. Rd., Honolulu, Hi. 96813, and David N. Okada, 1717 S. Dorsey Ln., #2110, Tempe, Ariz. 85281

Filed Oct. 30, 1987, Ser. No. 114,608

Int. Cl.[4] H01L *29/72, 27/02, 29/66, 27/14*

U.S. Cl. 357—34 **42 Claims**



1. A merged electronic device consisting of a gate means located above a channel means having a drain contact means located above a base means which is located above an emitter means, said device intended for generating useful electronic characteristics, where said channel means is resistive and can function as a bipolar junction transistor emitter means and collector means, and, when said channel means is functioning as a channel collector means and is resistive, collects a distributed injected current which flows across said base means from said emitter means toward said collector channel means due to a base current applied to said base means, and where said base current may be amplified (or attenuated) by an injection means into said emitter means which injects a current into the base means which is collected by said channel collector means when the channel base junction is reverse biased and which current only is partially collected or not collected by said channel collector means when said channel collector means is partially or wholly forward biased with respect to said base means, where said injected emitter to base current may recombine in part in said base means and or at the surface or interface on the side of the said base means opposite to said emitter means, and where the current density collected by said channel means is distributed along said channel means/base means interface and where said collected current density flowing along said resistive channel means may bias said channel means and where said channel means voltage drop may affect said collection of said injected current density affecting said distributed current collection behavior, thereby affecting the electrical characteristics of the device.

4,885,624

STACKED METAL-INSULATOR SEMICONDUCTOR DEVICE

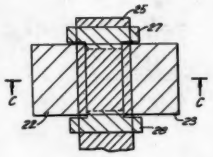
Takeshi Okazawa, Tokyo, Japan, assignor to Nec Corporation, Tokyo, Japan

Filed Oct. 31, 1988, Ser. No. 265,193

Claims priority, application Japan, Oct. 31, 1987, 62-274728

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—42 **3 Claims**



1. An MIS device of the stacked type comprising: a semiconductor substrate of one conductivity type; a first pair of source and drain regions of the other conductivity type formed in the semiconductor substrate in spaced relation from each other to define therebetween a first channel region; a first gate insulating film disposed over said first channel region; a gate electrode disposed on said first channel region through said first gate insulating film and extending transversely of said first channel region so as to constitute together with said first pair of source and drain regions one conductive type MIS-FET transistor; a second gate insulating film disposed over said gate electrode; a semiconductor film of said other conductivity type disposed along said gate electrode through said second gate insulating film, said semiconductor film being formed into I-shape; and a second pair of source and drain regions of said one conductivity type formed in the respective end portions of said I-shape of said semiconductor film in spaced relation from each other to define therebetween a second channel region to constitute together with said gate electrode the opposite conductive type MIS-FET transistor such that the length of said second channel region is arranged to intersect with that of said first channel region and said second pair of source and drain regions is prevented from overlapping with said first pair of source and drain regions by said I-shape of said semiconductor film.

4,885,625

INTEGRATED CIRCUIT CHIP MANUFACTURE

Stephen K. Sunter, Nepean, and Go S. Sunatori, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

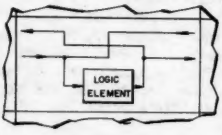
Continuation of Ser. No. 826,652, Feb. 6, 1986, abandoned. This application Mar. 23, 1989, Ser. No. 330,952

Int. Cl.[4] H01L *27/04*

U.S. Cl. 357—45 **13 Claims**

1. An integrated circuit device having a plurality of inte-

grated circuit cells, each cell containing o logic element, at least two input terminals each of which is connected to an input of the logic element, and at least two output terminals each of which is connected to an output of the logic element, a respective one of the input terminals and a respective one of the output terminals being located at each of two opposite sides of each cell with the input terminal at one of said opposite sides



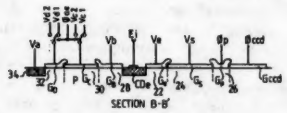
of the cell being diagonally opposite the input terminal at the other of said opposite sides and the output terminal at said one of said opposite sides being diagonally opposite the output terminal at said other of the opposite sides, and the cells being arranged side by side with at least one of said opposite sides being located next to one of said opposite sides of an adjacent cell to bring terminals of each cell into adjacency with terminals of at least one adjacent cell.

4,885,626

CHARGE-READING DEVICE FOR LINEAR PHOTOSENSOR WITH LINE STRUCTURE ANTI-DAZZLE DEVICE

Jean-Louis Coutures, St-Egreve, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 10, 1989, Ser. No. 308,454
Claims priority, application France, Feb. 12, 1988, 88 01683
Int. Cl.[4] G11C *19/28;* **H01L** *29/78, 27/14;* **H04N** *3/14*
U.S. Cl. 377—58 **3 Claims**



1. A charge-reading device for a linear photosensor, comprising a semiconductor substrate, an input diode, a charge storage gate covering a charge storage region, an input gate covering an input region interposed between a first side of the input diode and the charge storage region, and a passage gate covering a region adjacent to the charge storage region and separating this region from a charge transfer reading register, wherein there is provision for a first substrate region covered by a first gate carried to a constant potential, such that the potential (V1) in the first region, when there are no charges, is greater than the potential (Vo) in the input region when there are no charges, the first region being adjacent to a second side of the input diode, opposite the first side, a second substrate region adjacent to the first region and covered by at least one second gate, and a charge removal region adjacent to the first substrate region, the second gate being carried to potentials that vary cyclically according to two stages, namely:

a removal stage wherein the potential imposed by the second gate in the second region is greater than the potential of the first region,

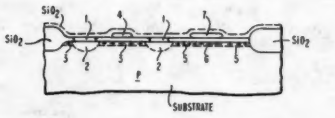
an integration stage wherein the potential imposed by the second gate in the second region is lower than the potential of the first region, and lower than the potential in the input region, the potential of the passage gate being carried to a high value for a short instant beginning after the start of the removal stage, and this potential being kept at a low value throughput the integration stage.

4,885,627

METHOD AND STRUCTURE FOR REDUCING RESISTANCE IN INTEGRATED CIRCUITS

Nathen P. Edwards, Darien, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1988, Ser. No. 259,473
Int. Cl.[4] H01L *29/04, 29/78, 23/48*
U.S. Cl. 357—59 **5 Claims**



1. An integrated circuit semiconductor structure having reduced circuit spreading resistance values comprising a substrate of semiconductor material, that exhibits a given value of bulk resistance;

a first layer of doped conductive semiconductor material disposed on said substrate functioning to form a transistor device source element in a region therein having a given value of resistance;

a second layer of doped conductive semiconductor material disposed on said substrate functioning to form a transistor device drain element in a region therein having a given value of resistance;

a third layer of doped conductive semiconductor material disposed over said substrate to from a transistor device gate element having a given value of resistance;

a buried contact structure formed in a region of at least one of said first and second layers of doped conductive semiconductor material, said buried contact structure including a diffusion dopant material disposed in said at least one of said first and second layers of doped conductive semiconductor material proximate to said region of said one of said source and drain elements; and an overlayed layer of polysilicon material disposed on said buried contact structure region;

said buried contact structure region of dopant material diffused in said at least one of said first and second layers of doped conductive semiconductor material having a lower electrical resistance value in the order of three to four times less than the given resistance values of said first and second layers of doped conductive semiconductor material.

4,885,628

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yasuo Nagai, Maebashi; Isao Shimizu, Tamamura; Masatoshi Kimura, Ohme; Kenji Kaneko, Sagamihara; Takeaki Okabe, and Koozoo Sakamoto, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 39,118, Apr. 16, 1987, abandoned, which is a division of Ser. No. 768,320, Aug. 22, 1985, abandoned. This application May 8, 1989, Ser. No. 349,926
Claims priority, application Japan, Aug. 22, 1984, 59-173244; Aug. 22, 1984, 59-173245; Aug. 22, 1984, 59-173246
Int. Cl.[4] H01L *23/48, 29/46, 29/62*
U.S. Cl. 357—68 **8 Claims**

1. A semiconductor integrated circuit device comprising:

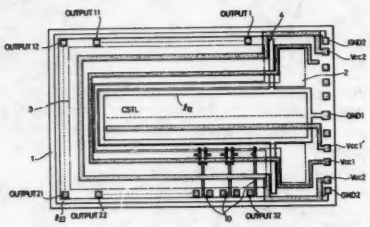
a semiconductor chip;

a first circuit formed in said semiconductor chip;

a second circuit formed in said semiconductor chip;

a high speed logic circuit formed in a central portion of said semiconductor chip;

a first operating potential line for supplying a first predetermined high-level operating potential to said first circuit;
a second operating potential line for supplying a first predetermined low-level operating potential to said first circuit;
a third operating potential line for supplying a second predetermined high-level operating potential to said second circuit;
a fourth operating potential line for supplying a third predetermined high-level operating potential to said high speed logic circuit; and
a fifth operating potential line for supplying a second predetermined low-level operating potential to said second circuit,
wherein said first predetermined high-level operating potential is higher than said second and third predetermined high-level operating potentials, wherein said high speed



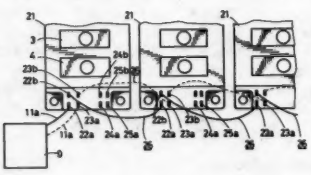
logic circuit is arranged in a central portion of said chip, wherein said second circuit is arranged to surround said high speed logic circuit, wherein said first circuit is arranged in a peripheral portion of said chip to surround said second circuit, wherein said first operating potential line is arranged adjacent to a periphery of said chip, wherein said third operating potential line is arranged in said chip inside of said first operating potential line, wherein said fourth operating potential line is arranged in said chip inside of said third operating potential line, and wherein said fifth operating potential line is so arranged inside of said first operating potential line as to surround said high speed logic circuit to protect said high speed logic circuit from an electrical field established by said first operating potential line, and wherein said second operating potential line has a major portion thereof arranged between said first operating potential line and said periphery of said chip.

4,885,629

SEMICONDUCTOR APPARATUS

Yoshio Takagi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1983, Ser. No. 517,712
Claims priority, application Japan, Aug. 7, 1982, 57-138181
Int. Cl.[4] H01L *25/10, 23/48*
U.S. Cl. 357—68 **4 Claims**



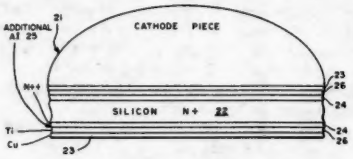
1. A semiconductor device, comprising a housing; semiconductor means within the housing for processing electrical signals; and electrode means extending through the housing and in contact with said semiconductor means, said electrode means including a plurality of discrete electrodes, each discrete electrode extending outside said housing and being formed outside as two terminals separated from each other and each adapted to be coupled to a common external signal.

4,885,630

HIGH POWER MULTI-LAYER SEMICONDUCTIVE SWITCHING DEVICE HAVING MULTIPLE PARALLEL CONTACTS WITH IMPROVED FORWARD VOLTAGE DROP

Victor A. K. Temple, Clifton Park, N.Y., assignor to Electric Power Research Institute, Palo Alto, Calif.

Continuation of Ser. No. 923,674, Oct. 27, 1986, abandoned. This application Jun. 24, 1988, Ser. No. 212,090
Int. Cl.[4] H01L *23/54, 25/08, 25/14*
U.S. Cl. 357—71 **11 Claims**



1. A high power multi-layer semiconductive switching device having multiple parallel contacts for accommodating large magnitudes of current comprising:
a large area unitary contact means substantially consisting of a material matching the thermal expansion characteristics of said semiconductive material of said switching device said unitary contact means being in electrical contact with said parallel contacts, said large area unitary contact means carrying at least one electrical contact layer making a thermal compression bond with said parallel contacts of said device so no relative movement between contacts is allowed, both said parallel contacts and said large area unitary contact means carrying at least one electrical contact layer capable of forming a said thermal compression bond at moderate temperatures, whereby the voltage drop across the parallel contacts is reduced and made substantially similar for each of said contacts.

4,885,631

HIGH RESOLUTION COLOR TELEVISION SIGNAL TRANSMISSION SYSTEM AND RECEIVER UTILIZING MOTION INFORMATION OF A PICTURE

Takahiko Fukinuki, Kokubunji; Yasuhiro Hirano, Hachioji; Hiroshi Yoshigi, Nishitama, and Hidehiko Jusa, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

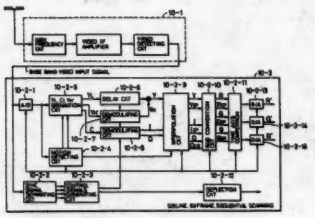
Continuation of Ser. No. 29,970, Mar. 25, 1987, abandoned, which is a continuation-in-part of Ser. No. 578,528, Feb. 9, 1984, Pat. No. 4,660,072, and a continuation-in-part of Ser. No. 26,281, Mar. 16, 1986. This application Aug. 19, 1988, Ser. No. 233,975
Claims priority, application Japan, Mar. 18, 1983, 58-44238
Int. Cl.[4] H04N *9/64, 9/78*
U.S. Cl. 358—21 R **6 Claims**

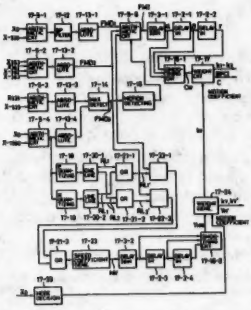
1. A color television signal transmission system comprising:
(a) sending means including first means for obtaining a luminance signal and a color signal of a video signal, first modulating means for modulating a first subcarrier by said color signal in order to obtain a modulated color signal, frequency converting means for converting one part of said luminance signal, which has a horizontal frequency higher than a predetermined horizontal frequency, into a first luminance signal having a horizontal frequency lower than said predetermined horizontal frequency and tempor-

al-vertical frequencies different from temporal-vertical frequencies of said modulated color signal, and multiplexing means for multiplexing another part of said luminance signal having a horizontal frequency lower than said predetermined horizontal frequency, said modulated color signal and said first luminance signal in order to produce a multiplexed video signal of a color television signal to be transmitted;

(b) transmission means for transmitting said multiplexed video signal within a horizontal frequency band lower than said predetermined horizontal frequency; and

(c) receiving means for reproducing said luminance signal and said color signal from said multiplexed video signal and including motion detecting means for detecting motion information of a picture from said multiplexed video signal, separating means for separating said another part of said luminance signal, said first luminance signal and said modulated color signal in response to said detected motion





information, first demodulating means for reproducing said color signal from said modulated color signal, and second demodulating means for reproducing said one part of said luminance signal from said first luminance signal;

wherein said motion detecting means includes first motion detecting circuit means for detecting first motion information from a horizontal frequency component lower than the horizontal frequency of said modulated color signal and luminance signal of a frame difference signal between a first signal having motion which is to be detected and a second signal separated by a frame period from said first signal, and second motion detecting circuit means for detecting at least one of second motion information obtained from a sum of two of frame difference signals of two scanning lines vertically adjacent to a line on which said first signal is included and third motion information obtained from two frame difference signals on a scanning line having the same vertical position.

4,885,632

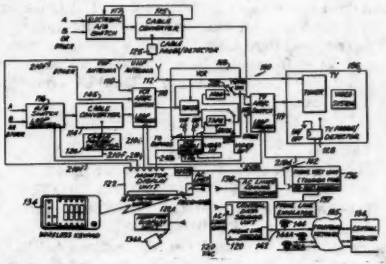
SYSTEM AND METHODS FOR MONITORING TV VIEWING SYSTEM INCLUDING A VCR AND/OR A CABLE CONVERTER

Kent W. Mabey, West Jordan, Utah; Joseph M. Boska, Columbia, Md., and Stephen L. Richards, Gallatin, Mo., assignors to AGB Television Research, Columbia, Md.

Continuation-in-part of Ser. No. 162,220, Feb. 29, 1988, abandoned. This application Mar. 16, 1988, Ser. No. 168,651

Int. Cl.[4] H04N *9/00, 17/06*

U.S. Cl. 358—84 **30 Claims**



1. A system for monitoring a television viewing system which includes a TV and a VCR coupled thereto, said monitoring system comprising:

first means for obtaining a signal related to the frequency of the channel to which a tuner in said television viewing system is tuned;

second means including a first programmed processor and associated memory for receiving said signal and processing it to obtain information related to the channel to which said tuner is tuned; and

third means including a second programmed processor and associated memory for generating a fingerprinting signal for recording in the vertical blanking interval of a TV signal tuned by said tuner and being recorded by said VCR, said third means comprising:

means coupled to receive a TV signal corresponding to said TV signal being recorded by said VCR;

means for receiving channel information from said second means and generating said fingerprinting signal including channel information encoded therein for recording by said VCR in the vertical blanking interval of said TV signal being recorded by said VCR; and

means for generating a timing signal related to the timing of said TV signal being recorded by said VCR, said timing signal being used to generate said fingerprinting signal in the vertical blanking interval of said TV signal being recorded by said VCR;

said system further comprising means for coupling said fingerprinting signal generated by said third means to a point in said VCR where it is mixed with said TV signal being recorded by said VCR and recorded therewith in the vertical blanking interval thereof.

30. A system monitoring a television viewing system which includes a TV and a VCR coupled thereto, said monitoring system comprising:

first means for obtaining a signal related to the frequency of the channel to which a tuner is said television viewing system is tuned;

second means for receiving said signal and processing it to obtain information related to the channel to which said tuner is tuned; and

third means for generating a fingerprinting signal for recording in the vertical blanking interval of a TV signal tuned by said tuner and being recorded by said VCR, said third means comprising:

means coupled to the VIDEO OUT terminal of said VCR for receiving a TV signal corresponding to said TV signal being recorded by said VCR;

means for receiving channel information from said second means for generating said fingerprinting signal including channel information encoded therein for recording by said VCR in the vertical blanking interval of said TV signal being recorded by said VCR; and

means for generating a timing signal related to the timing of said TV signal being recorded by said VCR, said timing signal being used to generate said fingerprinting signal in the vertical blanking interval of said TV signal being recorded by said VCR;

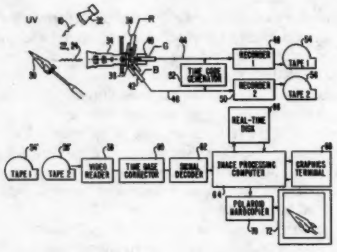
said third means being coupled to the VIDEO IN terminal of said VCR for coupling said fingerprinting signal thereto, said third means including means for preventing said VCR from switching signals to the record heads thereof due to coupling at said VIDEO IN terminal of said third means.

4,885,633

QUANTITATIVE SURFACE TEMPERATURE MEASUREMENT USING TWO-COLOR THERMOGRAPHIC PHOSPHORS AND VIDEO EQUIPMENT

Gregory M. Buck, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 13, 1988, Ser. No. 205,900
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—93 **3 Claims**



1. A method of measuring surface temperature of an object comprising the step of:

(a) applying a blue-green thermographic phosphor coating to the object, the blue-green phosphor coating emitting both blue and green light when activated by receiving electromagnetic radiation with a wavelength between 100 to 400 nanometers,

(b) activating the coating with ultraviolet light during a temperature measurement period to produce blue and green light emission of at least two wavelengths,

(c) detecting the intensity of said blue and green light emissions and producing signals indicating the intensity of the light received in said blue and green colors with centers between 430 to 470 nanometers and 510 and 560 nanometers respectively.

(d) producing a temperature indication in dependence upon a ratio of the intensity of said blue and green light emissions by calculating a ratio between said blue and green light signals and outputting a temperature signal in dependence upon said calculated ratio; and

(e) calibrating the calculated ratio including the step of:

(i) applying the blue-green thermographic phosphor coating to a sample;

(ii) heating the sample to known temperature while activating the blue-green thermographic phosphor coating;

(iii) producing the signals indicating the intensity of light receive in the blue and green color bands; and

(iv) calculating and recording standard ratios between blue and green light emissions at the known temperatures, and

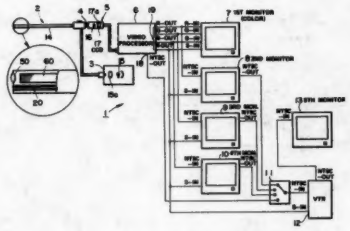
thereafter comparing said calculated and standard ratios.

4,885,634

ENDOSCOPE APPARATUS CAPABLE OF MONOCHROME DISPLAY WITH RESPECT TO SPECIFIC WAVELENGTH REGIONS IN THE VISIBLE REGION

Hisao Yabe, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1988, Ser. No. 226,486
Claims priority, application Japan, Oct. 27, 1987, 62-272611
Int. Cl.[4] A61B *1/04*; H04N *7/18*
U.S. Cl. 358—98 **26 Claims**



1. An endoscope apparatus, comprising:

an optical endoscope composed of:

an elongate inserting section,

a light guide inserted into said inserting section and adapted to transmit a light beam applied to an incidence end surface and give it off through an outlet end surface, an objective optical system adapted to form the image of a subject illuminated, and

an image guide adapted to transmit the image obtained by said objective optical system to the side of an eyepiece;

a television camera composed of:

a lens adapted to form the image transmitted by said image guide, and

a solid image pickup element arranged at the position where the image forming is effected by said lens and equipped with a photoelectric transformation function;

a light source means adapted to supply illuminating light to the incidence end surface of said light guide; an image signal processing means composed of:

a color image signal generating means adapted to generate predetermined color image signals by performing signal-processing with respect to said solid image pickup element, and

a specific-wavelength-region-image signal generating means equipped with output terminals adapted to emit image signals based exclusively on specific wavelength region components in the visible region for generating said color image signals; and

a display means composed of:

a color image display section adapted to display said color image signals, and

a specific-wavelength-image-dislay section adapted to display said image signals based exclusively on specific wavelength region components.

4,885,635

ENDOSCOPE LIGHT SOURCE APPARATUS

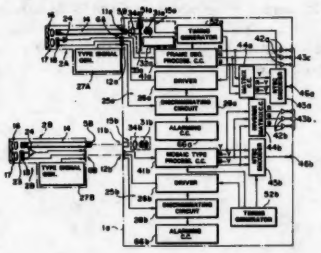
Kenji Kimura, Tachikawa; Hiroki Hibino, Hachioji; Toshiaka Nisikori, Sagamihara; Hisao Ogiu, Hachioji; Atsushi Kidawara, Tachikawa; Hisao Yabe; Koji Takamura, both of Hachioji; Jun Yoshinaga, Hino; Shinichi Kato, Oume, and Takeaki Nakamura, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 155,396, Feb. 12, 1988, abandoned. This application May 1, 1989, Ser. No. 346,299

Claims priority, application Japan, Feb. 17, 1987, 62-34028; Mar. 10, 1987, 62-54597; Apr. 23, 1987, 62-100947

Int. Cl.[4] H04N *7/18, 9/04*

U.S. Cl. 358—98 37 Claims



1. An endoscope light source apparatus to which an endoscope provided with a frame sequential type color imaging means, an endoscope provided with a color mosaic type color imaging means and an optical endoscope can be connected, said endoscope light source apparatus comprising:

a frame sequential light outputting means for outputting an illuminating light to said frame sequential type color imaging means; and

a white light outputting means for outputting an illuminating light to said color mosaic type color imaging means.

4,885,636

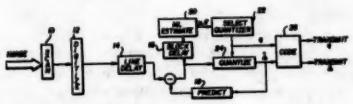
BLOCK ADAPTIVE LINEAR PREDICTIVE CODING WITH ADAPTIVE GAIN AND BIAS

James R. Sullivan, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 132,080, Dec. 10, 1987, which is a continuation of Ser. No. 65,230, Jun. 22, 1987, abandoned. This application Aug. 15, 1988, Ser. No. 232,258

Int. Cl.[4] H04N *7/137*

U.S. Cl. 358—133 18 Claims



1. An improved block adaptive predictive coding method of the type wherein a quantizer is selected from a finite set of quantizers to encode a block of error signals based on the statistics of the error signals in the block, wherein the improvement comprises:

selecting block quantizers based on a plurality of statistical parameters.

4,885,637

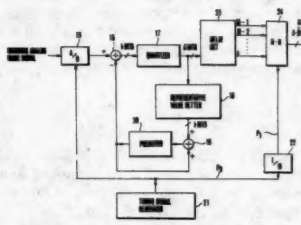
ENCODER

Akihiro Shikakura; Koji Takahashi; Masahiro Takei, and Tomohiko Sasatani, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1987, Ser. No. 77,335

Int. Cl.[4] H04N *7/12*

U.S. Cl. 358—133 30 Claims



1. An encoder for encoding an image signal by digitizing said signal, comprising:

(a) sample signal forming means for forming sample signals by receiving and serially sampling said image signal;

(b) coded data forming means arrived to form and produce coded data which corresponds to said sample signals formed by said temple signal forming means; and

(c) data conversion means arranged to convert an m number (m: an integer which is at least 2) of coded data output from said coded data forming means into data consisting of the same number of bits as the total number of bits of said m number of coded data and having another bit pattern.

4,885,638

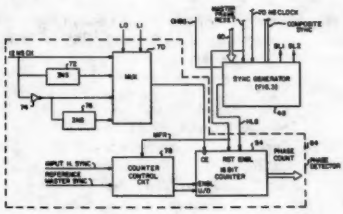
VIDEO DEVICE SYNCHRONIZATION SYSTEM

Phillip P. Bennett, San Mateo, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 745,567, Jun. 17, 1985, abandoned, which is a division of Ser. No. 363,670, Mar. 31, 1982, Pat. No. 4,532,547. This application Apr. 27, 1988, Ser. No. 188,093

Int. Cl.[4] H04N *5/04*

U.S. Cl. 358—148 5 Claims



1. A video device synchronization system for synchronizing an output signal in response to periodically occurring input video sync signals and respective periodically occurring input reference timing signals externally developed independently of said input video sync signals, said system comprising

a phase detector responsive to the phase of the periodically occurring input video sync signals and the phase of the respective periodically occurring reference timing signals to generate an average phase difference signal representing an average of phase differences between separate ones of a multiplicity of said periodically occurring input video

sync signals and respective said periodically occurring reference timing signals, said phase detector including means responsive to the phase of one of said periodically occurring input video sync signals and the phase of a respective one of said periodically occurring reference timing signals for producing a respective individual phase difference signal representing the difference in the respective phases, and means for combining multiplicity of said individual phase difference signals to generate said average phase difference signal; and

a signal utilization device responsive to the average phase difference signal for providing the output signal at a phase relative to the phase of the periodically occurring input video sync signals determined by the average phase difference signal.

4,885,639

APPARATUS FOR ELIMINATING A NOISE SIGNAL

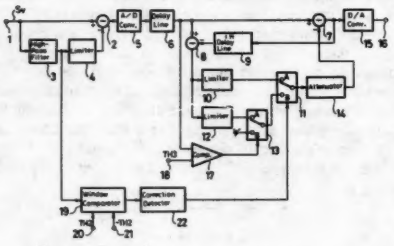
Tetsuro Nakata; Ichitaro Sato, and Tooru Eto, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 202,822

Claims priority, application Japan, Jun. 9, 1987, 62-143773

Int. Cl.[4] H04N *5/213*

U.S. Cl. 358—167 **17 Claims**



1. A circuit for eliminating a noise from a video signal comprising:

first means for eliminating a noise from the video signal, said first means having a first-order circuit configuration;

detecting means for detecting a level in a relatively high frequency portion of the video signal, said detecting means generating a control signal during an interval in which said level is greater than a predetermined first threshold level; and

averaging means controlled by said control signal for averaging said video signal over a plurality of lines of the video signal during said interval.

4,885,640

IMAGE READING APPARATUS

Shoichiro Yoshiura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 5, 1987, Ser. No. 117,484

Claims priority, application Japan, Nov. 7, 1986, 61-171809[U]; Nov. 7, 1986, 61-171812[U]

Int. Cl.[4] H04N *1/04*

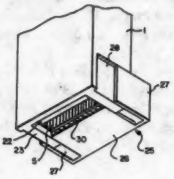
U.S. Cl. 358—400 **3 Claims**

1. In an image reading apparatus comprising a housing having a contact surface for slidably contacting a document, a scanning window formed on said contact surface and reading means for reading an image on said document through said window, said apparatus being adapted to be manually moved with respect to said document for reading said image, the improvement wherein said apparatus further comprises

a transparent member disposed near said window such that said reading means read said image therethrough,

a cleaner for cleaning said transparent member, and

a cover which is attached to said housing movably between a first position where said cover covers said window and a second position where said cover uncovers said window, a portion of said cover being coplanar with said



contact surface when said cover is in said second position so as to provide a substantially greater area of support to said apparatus than said contact surface on a document being scanned.

4,885,641

IMAGE COMMUNICATION APPARATUS

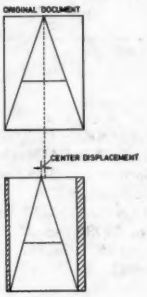
Yoshiaki Kato, Higashi Kurume, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1986, Ser. No. 873,541

Claims priority, application Japan, Jun. 17, 1985, 60-131363; Jun. 17, 1985, 60-131364; Jun. 17, 1985, 60-131365; Jun. 17, 1985, 60-131366; Jun. 17, 1985, 60-131367; Jun. 17, 1985, 60-131368; Jun. 17, 1985, 60-131369

Int. Cl.[4] H04N *1/387*

U.S. Cl. 358—296 **24 Claims**



1. An image reception apparatus comprising:

reception means for receiving image information;

recording means for recording received image information on recording paper, said recording means being capable of recording the received image information within a predetermined area of the recording paper, the predetermined area being smaller than the recording paper; and

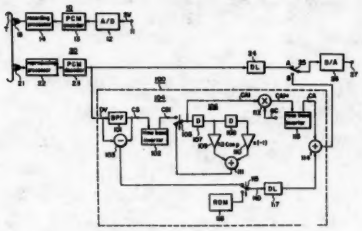
reduction processing means for reducing the received image information so as to record the received image information within the predetermined area, wherein the recording paper includes an area on which an image cannot be recorded, and wherein the predetermined area is a fixed area determined by an area on which an image can be recorded.

4,885,642

METHOD AND APPARATUS FOR DIGITALLY RECORDING AND REPRODUCING A COLOR VIDEO SIGNAL FOR A SECAM SYSTEM

Tetsuo Senba, Kanagawa, Japan, assignor to Sony Corp., Tokyo, Japan

Filed Jun. 7, 1988, Ser. No. 203,168
Claims priority, application Japan, Jun. 11, 1987, 62-145936
Int. Cl.[4] H04N 9/79, 9/86
U.S. Cl. 358—310 5 Claims



1. A method of digitally recording and reproducing a color video signal for a SECAM system, said signal comprising a scanning interval and an earlier occurring horizontal blanking interval, said horizontal blanking interval including a horizontal synchronizing signal and a non-modulated carrier, said method comprising:

digitizing and recording the video signal during the scanning interval but not during the horizontal blanking interval; and

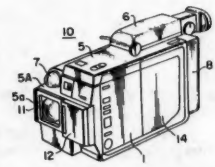
reproducing the digital signal, inverting the time base of the data from said scanning interval, restoring, by means of a ditigal filter, the earlier occurring non-modulated carrier as a function of the time-base inverted data, inverting the time-base of said non-modulated carrier thus restored, and inserting the non-modulated carrier in a predetermined portion of said horizontal blanking interval.

4,885,643

VTR-INTEGRATED CAMERA HAVING PLAYBACK FUNCTION WITH MOVABLE LENS COVER FOR ENABLING RECORDING MODE AND PLAYBACK MODE AND METHOD THEREFOR

Shigeru Ichimura, Ibaraki; Seiko Nakasuna, Katsuta; Takeshi Kawarai, Ibaraki; Takanori Nishiyama, Koganei, and Shuji Toyoshima, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 3, 1988, Ser. No. 151,967
Claims priority, application Japan, Feb. 6, 1987, 62-24510
Int. Cl.[4] H04N 5/76
U.S. Cl. 358—335 15 Claims



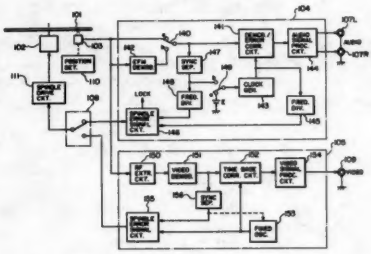
1. A VTR-integrated camera with a recording function comprising a VTR unit having recording and playback functions and camera unit integrated with each other, wherein the VTR unit is arranged in lateral alignment with the camera unit, and the front part of the VTR unit corresponding to the front part of the camera unit is arranged in substantially the same plane as the front part of the camera unit, said front part of the VTR unit including a lid for covering the front lens part of the camera unit and is movable between a position where the front lens part of the camera unit is covered and a position where the corresponding front part of the VTR unit is covered, said VTR-integrated camera further comprising means for rendering the VTR unit ready for camera recording in operatively interlocked relations with the movement of the lid from a position where the front lens part of the camera unit is covered to another position where the corresponding front part of the VTR unit is covered.

4,885,644

SPINDLE SERVO DEVICE FOR DATA RECORDING DISK REPRODUCING APPARATUS

Hidehiro Ishii; Junichi Yoshio; Osamu Watanabe; Takeshi Izumo; Noriyoshi Takeya; Kazuhiko Katakami; Masayori Shinohara, and Masao Yoshida, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 149,763, Jan. 27, 1988, Pat. No. 4,872,068.
This application Dec. 22, 1988, Ser. No. 288,190
Claims priority, application Japan, Jan. 28, 1987, 62-19350; May 14, 1987, 62-117867; Jun. 19, 1987, 62-152472; Jun. 19, 1987, 62-152475
Int. Cl.[4] G11B 7/00
U.S. Cl. 358—342 2 Claims

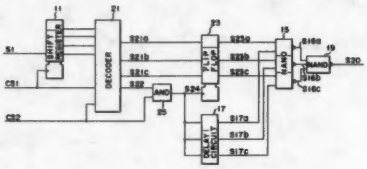


1. In a spindle servo device for a data recording disk reproducing apparatus in which a spindle motor rotationally drives said disk and said disk has a region in which a frequency modulated video signal and a prescribed digital signal are recorded in multiplex form in a location at least partially in the radial direction of the disk, the improvement comprising; means for detecting a phase difference between a synchronizing signal contained in a reproduced digital signal and a reference signal; means for generating a control signal based on the detected phase difference; means for controlling a rotational speed of a spindle motor driving said disk in accordance with said control signal; means for indicating whether said disk is a compact disk or a composite disk, and if said disk is a composite disk, whether a portion being played is a first region containing only audio data or a second region, which is said region in which a frequency modulated video signal and a prescribed digital signal are recorded in multiplex form; and means for providing said reference signal as a fixed frequency signal when said indicating means indicates said disk is a compact disk or a first region of a composite disk and as a variable frequency when said disk is a composite disk and a portion being played is said second region.

4,885,645
WRITE COMPENSATOR FOR MAGNETIC DISK APPARATUS

Yasuichi Hashimoto, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 12, 1987, Ser. No. 84,145
Claims priority, application Japan, Aug. 20, 1986, 61-194589
Int. Cl.[4] G11B 5/09
U.S. Cl. 360—45 3 Claims



1. A write compensator comprising:

data converting means for converting input recording data into a predetermined recording data format;

write compensation information generating means for generating write compensation information on the basis of a conversion pattern of the input recording data or a data pattern of the recording data converted by said data converting means, said write compensation information generating means outputting a write recording data presence signal representing that recording data to be written is present;

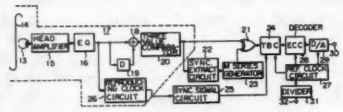
write compensation information storing means for storing the write compensation information from said write compensation information generating means in response to said write recording data presence signal and holding current write compensation information until the next write recording data signal is supplied; and

write-compensating means for performing write compensation of the converted recording data on the basis of the write compensation information stored in said write compensation information storing means.

4,885,646
DIGITAL RECORDER USING PARTIAL RESPONSE METHOD

Keiji Kanota, and Takahito Seki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,113
Claims priority, application Japan, Oct. 15, 1987, 62-260602
Int. Cl.[4] G11B 5/09
U.S. Cl. 360—46 2 Claims



1. In a digital recording-reproducing apparatus for recording and reproducing a digital signal on a metal evaporation tape by a rotary head, the combination comprising:

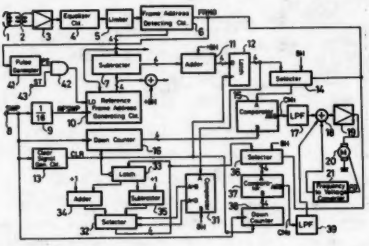
a recording circuit for supplying a digital signal to said rotary head, said recording circuit including a class 4 partial-response encoder, an analog-to-digital converter for converting an input analog signal to a corresponding digital signal, and an M series signal generator for scrambling said digital signal; and

a reproducing circuit supplied with a reproduced signal from said rotary head, said reproducing circuit including a class 4 partial-response decoder, a three-level comparator supplied with an output signal of said class 4 partial-response decoder, and a digital-to-analog converter for converting a digital signal obtained from said three-level comparator.

4,885,647
APPARATUS FOR REPRODUCING A DIGITAL SIGNAL

Hiraku Sugiki, Saitama; Hiroyuki Ino, and Tadashi Fukami, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,095
Claims priority, application Japan, Jan. 28, 1987, 62-17970
Int. Cl.[4] G11B 15/52
U.S. Cl. 360—73.12 5 Claims



1. Apparatus for reproducing digital signals which are recorded in one or more oblique tracks on a tape by rotary heads, the digital signals being formatted so that one frame is formed of a plurality of data blocks, each data block including a frame address which varies with every frame, said apparatus comprising:

(a) rotary heads for reproducing digital signals from the tape;

(b) means for transporting the tape relative to the rotary heads;

(c) deriving means for deriving the frame address from the digital signals reproduced by the rotary heads;

(d) generating means for generating a reference frame address which varies at a predetermined period;

(e) comparing means for comparing the derived frame address with the reference frame address and generating a control signal; and

(f) control means for controlling the tape speed of the tape transporting means in response to the control signal.

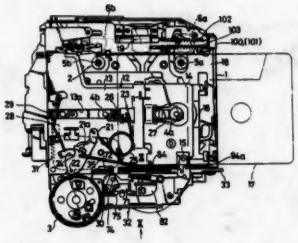
4,885,648
CASSETTE TAPE RECORDER HAVING A TAPE CASSETTE EJECTOR AND HEAD SHIFTER WITH COMMON DRIVE MECHANISM

Toshio Yoshimura, Kawasaki, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,350
Claims priority, application Japan, Nov. 25, 1987, 62-298610
Int. Cl.[4] G11B 15/00
U.S. Cl. 360—96.5 13 Claims

1. A cassette tape recorder, comprising a tape feeding mechanism, a tape feeding drive motor, a rotation transmitting mechanism for transmitting the turning force of said tape feeding drive motor to said tape feeding mechanism, an ejecting mechanism for moving a tape cassette from an operative position to an unloading position, a selectively engaging mechanism for selectively engaging with said rotation transmitting mechanism so as to be driven by the turning force of said tape feeding drive motor, a driving force transmitting member for transmitting the operating force of said selectively engaging mechanism to said ejecting mechanism, a trigger mechanism for operating said selectively engaging mechanism to engage with said rotation transmitting mechanism, a head shifting

mechanism for shifting a magnetic head and pinch roller from respective inoperative to operative positions, a head holding mechanism including a head holding electromagnet for holding said magnetic head and said pinch roller at the respective operative positions, said driving force transmitting member being alternatively movable between a first position in which it engages with said ejecting mechanism and a second position in which it engages with said head shifting mechanism, means for receiving a tape cassette and for moving the received tape cassette from the unloading to the operative position, said head holding mechanism and said trigger mechanism being rendered operative in response to loading of a tape cassette to the operative positions so that said driving force transmitting member is moved to the second position by said head holding mechanism and said selectively engaging mechanism is engaged with said



rotation transmitting mechanism by said trigger mechanism thereby to operate said head shifting mechanism to move said magnetic head and said pinch roller to the respective operative positions at which said magnetic head and said pinch roller are thereafter held by said head holding mechanism, an ejection initiating means for rendering said head holding electromagnet inoperative to cancel holding of said head shifting mechanism by said head holding mechanism and to move said driving force transmitting member to the first position and for simultaneously rendering said trigger mechanism operative to engage said selectively engaging mechanism with said rotation transmitting mechanism, and a stopping signaling means for rendering said head holding electromagnet inoperative to cancel holding of said head shifting mechanism by said head holding mechanism.

4,885,649

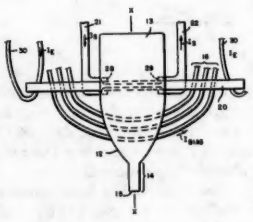
THIN FILM HEAD HAVING A MAGNETO-RESTRICTIVE READ ELEMENT

Shyam C. Das, Acton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 33,446, Apr. 1, 1987, abandoned. This application Oct. 4, 1988, Ser. No. 253,390

Int. Cl.[4] G11B *5/17, 5/31, 5/39*

U.S. Cl. 360—113 **19 Claims**



1. A read/write head for use in a magnetic storage device in a digital data processing system for writing data in the form of magnetic flux onto, and reading data from, a magnetic media which moves relative to the head, the head having two magnetic pole pieces each with a yoke region which tapers to a pole tip, an energizable coil situated between the pole pieces in the yoke region for generating magnetic flux, one of the pole pieces having a slot in the yoke region, the head further including a strip of magneto-resistive material adjacent and oriented transverse to magnetic flux traversing the slot, adapted to be connected to sensing equipment such that as the media is moved relative to the head the resistance of the magneto-resistive strip varies in response to the variations in the magnetic flux recorded onto the media, the sensing equipment sensing the variations in the resistance of the magneto-resistive strip, an electrically insulating layer separating the magneto-resistive strip from the slotted pole piece.

4,885,650

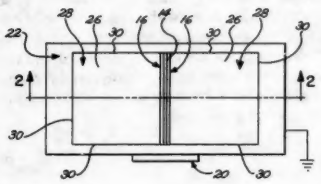
MAGNETIC HEAD HAVING BORON CARBIDE SURFACES

Eugene F. Banks, Livonia, and Charles B. Hebeler, Farmington, both of Mich., assignors to Unisys Corporation, Detroit, Mich.

Filed Apr. 25, 1988, Ser. No. 185,603

Int. Cl.[4] G11B *5/255*

U.S. Cl. 360—122 **3 Claims**



1. A magnetic head for reading or writing information magnetically encoded on a substrate which is moved relative to the magnetic head such that the substrate rubs against the magnetic head, comprising:

a magnetic core;

a plurality of pole tips conductively connected to said magnetic core;

a wire coil wrapped around said magnetic core;

an electrically conductive housing enclosing said magnetic core, said housing being connected to ground and being electrically isolated from said magnetic core;

a conductive boron carbide contact surface on the magnetic core and in contact with said electrically conductive housing and adjacent to the pole tips against which the substrate rubs against as the substrate is moved relative to the magnetic head,; and

means for electrically grounding said contact surface to said housing and to ground and means for electrically isolating said contact surface from said magnetic core.

4,885,651

TAPE CASSETTE WITH LOW FRICTION SLIDE MEMBER FOR GUIDING MOVEMENT OF A LID THEREON

Haruo Shiba; Masatoshi Okamura, and Kenji Hashizume, all of Nagano, Japan, assignors to TDK Corporation, Japan

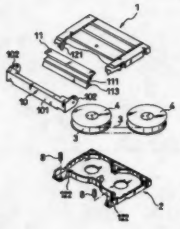
Continuation-in-part of Ser. No. 795,184, Nov. 5, 1985, Pat. No. 4,717,980. This application Nov. 20, 1987, Ser. No. 123,131

Claims priority, application Japan, Nov. 7, 1984, 59-169693; Nov. 7, 1984, 59-169694

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.[4] G11B *23/08*

U.S. Cl. 360—132 **17 Claims**



1. A tape cassette having a case, a magnetic tape in the case, and a pair of reels in the case for winding the magnetic tape, said case having a passage through which the magnetic tape is stretched, said tape cassette comprising

an outer lid pivotally mounted on said case to open and close the outside of said passage;

an inner lid pivotally mounted on the inside of said outer lid to open and close the inside of said passage;

a pair of slide members formed on opposite sides of said inner lid; and

guide means formed in said case to guide said pair of slide members, said guide means comprising a pair of guiding components with each component situated adjacent a respective slide member with said slide members being made of polyacetal resin, polycarbonate resin, polyamide resin, Teflon resin, or metallic material and said case with said guide means being made of polystyrene resin,

whereby white dust formation and contamination of the running tape are prevented.

4,885,652

DISK CARTRIDGE

Vurnen J. Leonard, Minneapolis, Minn., and Masayuki Kuroda, Yokohama, Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn. and Sony Corporation, Tokyo, Japan

Filed Jul. 11, 1988, Ser. No. 217,442

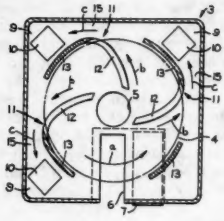
Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 **6 Claims**

1. A generally square disk cartridge adapted to contain a circular recording/playback disk in such a way that the disk is free to rotate, comprising:

at least one air filter disposed beyond the outer circumference of the said disk and within a corner of said cartridge; and

at least one circular rib adjacent said outer circumference of said disk and between said disk and said filter which induces air flow generated by rotation of said disk to said air filter.



4,885,653

DISK CARTRIDGE WITH A HUB HAVING AN OUTSERT MOLDED CONTROL RING

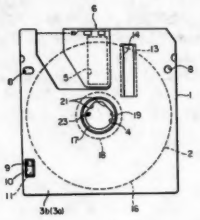
Yoshitake Kato, Ibaraki, Japan, assignor to Hitachi Maxell, Ltd., Ibaraki, Japan

Continuation of Ser. No. 23,279, Mar. 9, 1987, abandoned. This application Apr. 19, 1989, Ser. No. 342,581

Claims priority, application Japan, Mar. 7, 1986, 61-50878

Int. Cl.[4] G11B *23/03, 5/82*

U.S. Cl. 360—133 **16 Claims**



1. A disk cartridge which comprises a case and a disk within the case, the disk comprising a circular magnetic sheet and a hub with a circular metal plate flange and a control ring integrated with the flange by outsert molding the control ring from a compound plastic of a plastic material containing 5 to 40% by weight of a filler, wherein the flange covers substantially a central area defined by the control ring, the circular magnetic sheet is fixed to the flange at the outer periphery thereof and the control ring has a positioning surface at an inner peripheral wall thereof for centering the disk on a disk drive.

4,885,654

DEVICE FOR ARCLESS SWITCHING OF ELECTRICAL CIRCUITS

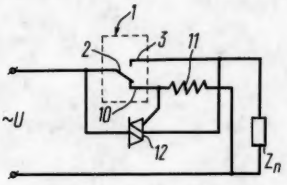
Viktor A. Budyko, ulitsa Mira, 20,kv. 60; Andrei F. Ivanchenko, Angolenko, 14a,kv.17; Vladimir M. Krokhmal, Lenina, 58, kv.15; Vladimir V. Konovalenko, Vodonapornaya, 16a; Georgy V. Nechvolodov, Avramenko, 12,kv.8; Boris N. Lastochkin, Lenina,58, kv.4, and Valentin D. Kutsov, Kedrovaya,67, all of Zaporozhie, U.S.S.R.

PCT No. PCT/SU86/00122, § 371 Date Jun. 29, 1988, § 102(e) Date Jun. 29, 1988, PCT Pub. No. WO88/04100, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 28, 1986, Ser. No. 241,979

Int. Cl.[4] H02H *7/00*

U.S. Cl. 361—13 5 Claims



1. A device for arcless switching of electrical circuits, comprising:

a power make contact having a movable contact and a fixed contact, said movable contact being connected to a first pole of a supply source and being a movable contact of a make-and-break contact assembly, said fixed contact being a fixed make contact of the make-and-break contact assembly;

a controlled semiconductor device having a control lead, and power leads connected in parallel with said movable and fixed contacts of said power make contact;

a control circuit including said movable contact of said power make contact, a fixed contact electrically coupled to said control lead of said controlled semiconductor device, and a resistor connected between said control lead of said controlled semiconductor device and a second pole of the supply source, said fixed contact of the control circuit being a fixed break contact of the make-and-break contact assembly, and

the controlled semiconductor device being saturated in any intermediate position of the movable contact to shunt all contacts of the make-and-break contact assembly and to produce an additional parallel path, aside from the contacts of the make-and-break contact assembly, for switching current and control circuit current.

4,885,655

WATER PUMP PROTECTOR UNIT

Lamar D. Springer, and Larry D. Springer, both of Dayton, Ohio, assignors to Spring Valley Associates, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 106,048, Oct. 7, 1987, Pat. No. 4,841,404. This application Sep. 13, 1988, Ser. No. 243,886

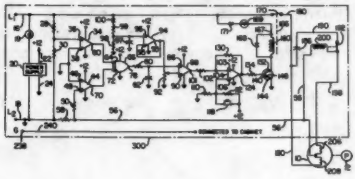
Int. Cl.[4] H02H *7/09*

U.S. Cl. 361—30 7 Claims

1. A protective circuit for a liquid pump which is operated by an electric motor, of the type having a start winding and a run winding, alternating current electric circuit means for connection to a source of electrical energy and for energization of the electric motor, the alternating current electric circuit means being of the type provided with a first conductor and a second conductor, the combination comprising:

sensing means including first sensing means, the first sensing means sensing the alternating current voltage applied to the electric circuit means and providing a constant direct current voltage during each half cycle that the voltage applied to the electric circuit means has a given potential, second sensing means, the second sensing means sensing the alternating current flow in the electric circuit means and providing a constant direct current voltage during each half cycle that alternating current flow is in a given direction,

phase detector means, first connection means, the first connection means joining the first and second sensing means to the phase detector means, the phase detector means providing a direct current voltage output during the time one of the first sensing means and the second sensing means produce a direct current voltage, voltage level detector means, second connection means, the second connection means joining the voltage level detector means to the phase detector means and to the alternating current electric circuit means and providing a direct current potential during the time that the average direct current voltage output of the phase detector means exceeds a potential applied to the voltage level detector means from the electric circuit means, third connection means, the third connection means joining the voltage level detector means to the sensing means for deenergization of the electric motor when the average current voltage output of the phase detector means provides a direct current potential in excess of a given magnitude, a start switch, means connecting the start switch to the start winding of the electric motor, a switch actuator coil, means connecting the switch actuator coil to the start winding of the electric motor, a capacitor, means connecting the capacitor to the first conductor and to the start switch, means connecting the run winding to the first conductor and to the second conductor,



and enclosure means mounting said sensing means and said phase detector means and said first connection means and said voltage level detector means and said second connection means and said third connection means within a common enclosure.

4,885,656

DIGITAL PROTECTIVE RELAY

Sunao Suzuki, and Wataru Kayamori, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 248,932

Claims priority, application Japan, Dec. 28, 1987, 62-333434

Int. Cl.[4] H02H *3/253*

U.S. Cl. 361—86 3 Claims

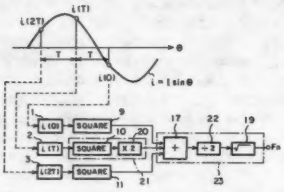
1. A digital protective relay, wherein instantaneous value of an AC electric quantity is sampled every 1/4 period of the period in the rated frequency of the AC electric quantity and converted into a digital value, and then operation processing is performed so as to detect a fault in the power system, said relay comprising:

a first calculating means for calculating square value of the digital value at a prescribed time;

a second calculating means for estimating square value of the digital value before or after the 1/4 period from the prescribed time and for performing double calculating of the square value;

a third calculating means for calculating square value of the digital value before or after the 2/4 period from the prescribed time;

a fourth calculating means for estimating the total of the



calculation results calculated by said first, second and third calculating means, for dividing the total value by two, and for estimating a root thereof; and

a fifth calculating means for comparing the calculation result of said fourth calculating means with a prescribed value.

4,885,657

THYRISTOR WITH TURN-OFF FACILITY AND OVERVOLTAGE PROTECTION

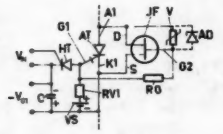
Horst Grüning, Baden, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Dec. 22, 1988, Ser. No. 288,272

Claims priority, application Switzerland, Dec. 23, 1987, 5014/87

Int. Cl.[4] H02H *3/20, 7/10*

U.S. Cl. 361—91 **10 Claims**



1. A thyristor with turn-off facility and overvoltage protection, in particular for use in a series circuit of several thyristors, which thryistor with turn-off facility has an anode, a cathode and a gate, wherein

(a) the overvoltage protection comprises a controllable resistor and an overvoltage sensor which monitors the voltage across the thyristor with turn-off facility;

(b) the controllable resistor is connected in parallel with the thyristor with turn-off facility between its anode and its cathode; and

(c) it is driven by the overvoltage sensor when the voltage across the thyristor with turn-off facility exceeds a predetermined limit.

4,885,658

APPARATUS FOR CONTROLLING THE OPERATION OF AN ELECTROMAGNETIC FUEL INTAKE OR EXHAUST VALVE OF AN INTERNAL COMBUSTION ENGINE

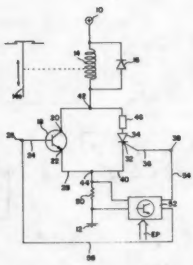
Josef Büchl, Lenting, Fed. Rep. of Germany, assignor to Audi AG., Ingolstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 855,896, Apr. 24, 1986, abandoned. This application Nov. 23, 1987, Ser. No. 124,490

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3515041

Int. Cl.[4] F01L *1/18*

U.S. Cl. 361—154 **10 Claims**



1. An apparatus for controlling the operation of an electromagnetically actuated gas exchange valve useful in an internal combustion engine, comprising:

an electromagnetic coil operatively connected to said valve;

circuit means for connecting said coil to a source of current;

current switching means selectively operable between conductive and non-conductive states for applying, when in its conductive state, high level current from said source to said coil for driving said valve into a predetermined position;

means responsive to said high level current in said coil for generating a signal;

a transistor rendered conductive in response to said signal for rendering said current switching means non-conductive by briefly diverting said high level current from said current switching means.

4,885,659

STATIC DISSIPATIVE MAT

Gilbert S. Nowell, Marietta, and Frederick D. Tenzer, Kennesaw, both of Ga., assignors to Pandel, Inc., Cartersville, Ga.

Filed Dec. 21, 1987, Ser. No. 136,101

Int. Cl.[4] H05F *3/00*

U.S. Cl. 361—212 **15 Claims**

1. A static dissipative, dimensionally stable dissipative surface covering material, such as a floor or table mat, which comprises:

(a) a flexible thermoplastic polymer layer of sufficient thickness to act as a floor or table mat and having a face surface and a back surface;

(b) a layer of an electrically conductive, vacuum deposited, metallized coated, open, nonwoven, resin bonded, fibrous sheet material bonded to or embedded within the thermoplastic polymer layer to provide a static dissipative surface covering material, and wherein the surface and volume

resistance of the surface covering material ranges from about 10^5 to 10^8 ohm or ohm/cm respectively and the said surface covering material lies flat; and

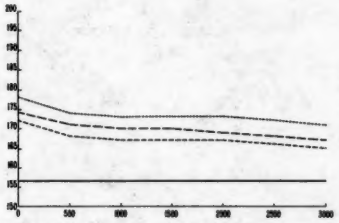
(c) an electrical grounding means to connect the fibrous sheet material to ground.

4,885,660

ELECTROLYTIC CAPACITOR FOR USE IN A WIDE TEMPERATURE RANGE AND HIGH VOLTAGES

Roland F. Dapo, Columbia, S.C., assignor to North American Philips Corporation, New York, N.Y.

Filed May 1, 1989, Ser. No. 345,398
Int. Cl.[4] H01G 9/02
U.S. Cl. 361—506 **10 Claims**



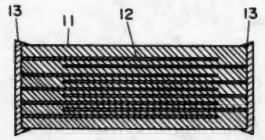
1. An electrolytic capacitor particularly adapted for use over a wide temperature range and at a medium to high operating voltage comprising aluminum anode and cathode members separated by an insulating spacer impregnated with an electrolyte consisting essentially of a solution of boric acid and an amine of a molecular weight of not greater than about 175 in a mixture of a member of the group consisting of butyrolactone, dimethylacetamide and dimethylformamide and mixtures of dimethylacetamide and dimethylformamide in a major amount and a polyalkylene glycol of a molecular weight of not greater than about 2000 in a minor amount, said electrolyte being free of aliphatic dibasic acids.

4,885,661

MULTI-LAYER CERAMIC CAPACITOR

Yoichiro Yokotani, Suita; Hiroshi Kagata, Neyagawa; Hiroshi Niwa, Chitose; Junichi Kato, Osaka, and Toshihiro Mihara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 18, 1988, Ser. No. 262,501
Int. Cl.[4] H01G 1/005, 4/06; C04B 35/46
U.S. Cl. 361—321 **6 Claims**



1. A multi-layer ceramic capacitor comprising:

(a) internal electrode layers; and

(b) ceramic dielectric layers extending between the internal electrode layers;

wherein said ceramic dielectric layers consists of low temperature sintering ceramics including an oxide containing a component A and component B, the component A being selected from a group I of lead, calcium, strontium, and barium, and the component B being selected from group II of magnesia, nickel, titanium, zirconium, zinc, niobium, tantalum, and tungsten, said component A including at least lead, and component B including at least two of the substances in the group II, a ratio between values a and b being chosen so that $0.985 <= a/b <= 1.110$, where the value a denotes the total mol value of the substances in the component A and the value b denotes the total mol value of the substances in the component B, said dielectric ceramic further containing copper oxide in an amount of about 0.03 to 0.65 wt% in terms of Cu_2O content, and wherein the sintering temperature of the ceramic is below 1080° C.;

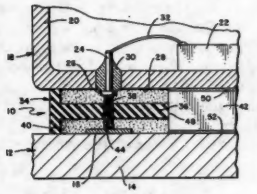
said internal electrode layers containing at least copper.

4,885,662

CIRCUIT MODULE CONNECTION SYSTEM

Wesley E. Bartholomew, Layton, Utah, and Michael C. Tolle, Los Angeles, Calif., assignors to Leonard A. Alkov, Del.

Filed Aug. 12, 1988, Ser. No. 231,424
Int. Cl.[4] H05K 7/20; H01R 9/00
U.S. Cl. 361—386 **11 Claims**



2. A circuit module connection system comprising:

a modular package case having electronic circuitry therein and having a bottom wall and a plurality of electric contacts extending from said bottom wall of said case in electric contact with the circuitry in said modular package case;

a printed wiring board having a plurality of pads thereon corresponding in position to said contacts on said modular package case;

a contact retainer between said case and said printed wiring board, said contact retainer being made of dielectric material and having an opening therethrough in alignment with each said contact and pad, said contact retainer being in contact with both said printed wiring board and said modular package case to seal the space around said contacts

a thermal member in thermal contact with both said modular package case and said printed wiring board, said thermal member being positioned within an opening in said contact retainer; and

a resilient electric contact in each of said openings in said retainer, each said contact being resiliently engaged with one of said contacts on said case and with one of said pads on said printed wiring board, each said resilient contact being formed of electrically conductive material to provide detachable electric connection between one of said pads and one of said contacts, said retainer separating said resilient contacts from each other to provide electrical separation therebetween.

4,885,663

FIBER OPTIC LIGHT EMITTING PANEL AND METHOD OF MAKING SAME

Jeffrey R. Parker, Concord, Ohio, assignor to Lumitex, Inc., North Royalton, Ohio

Filed Mar. 22, 1988, Ser. No. 171,844
Int. Cl.[4] F21V *8/00*
U.S. Cl. 362—32 70 Claims

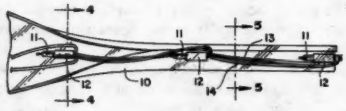
1. A light emitting panel comprising an emitter surface having a plurality of optical fibers extending from one end of said emitter surface toward another end thereof, said optical fibers having a plurality of disruptions or bends along the length of said optical fibers which cause light entering such optical fibers at said one end to be emitted from said disruptions or bends, said disruptions or bends being formed to cause the light output from said disruptions or bends to progressively increase with the distance from said one end for at least a portion of the length of said emitter surface, and coating means applied to said optical fibers in said portion of said emitter surface having a higher index of refraction than said optical fibers to increase the attenuation of light emitted from said portion of said emitter surface and produce a substantially uniform light output from said portion of said emitter surface.

4,885,664

SHEATHED STRING OF CHRISTMAS TREE LIGHTS

Terry Hermanson, New York, N.Y., assignor to Mr. Christmas Incorporated, New York, N.Y.

Filed Jan. 30, 1989, Ser. No. 303,303
Int. Cl.[4] F21P *1/02*; B29C *53/00*
U.S. Cl. 362—123 5 Claims



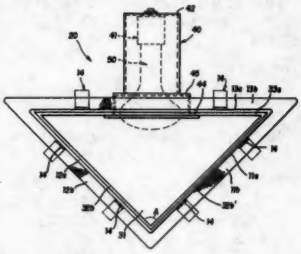
1. In a string of lights for a Christmas tree, the combination comprising a light transmitting generally tubular flexible sheath, an electric circuit enveloped by said sheath, a series of electric light sockets connected to said circuit at periodically spaced intervals, individual electric light bulbs in and received by said periodically spaced sockets, said sheath being a flexible membrane, having a set cross section in the shape of the spiral of Archimedes with the ends of the cross-section overlapped so that the sheath is held in place by the force of the set spiral of Archimedes and being capable of being forced to spread apart at any place along its length so as to expose a particular light or a particular light bulb socket and when so spread apart the two cross-sectional ends no longer overlap whereby a light bulb may be readily replaced without removing the entire or a substantial part of the circuit from the sheath, said sheath of said cross-section having a memory so that, when the spreading force is released, the spread apart plastic sill remember to return to the shape of the spiral or Archimedes.

4,885,665

TRIANGULAR ELECTRIC CEILING FIXTURE

Benjamin Birillo, 1045 Fifth Ave., New York, N.Y. 10028

Filed Jan. 9, 1989, Ser. No. 294,687
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—147 13 Claims



1. A ceiling fixture for mounting in a corner of a ceiling, the fixture comprising:

a frame having means for mounting within a corresponding opening at a corner of a ceiling;

a generally triangular shaped reflector attached to said frame, said reflector having a peaked roof, an open bottom and three substantially flat side walls with the first and second side walls forming a right angle therebetween and the third side wall connected to said first and second side walls to form a right triangle at the open bottom of the reflector;

a lamp housing connected to an opening in said third side wall and extending outwardly therefrom; and

an electrical socket mounted in said lamp housing and having means for receiving a lamp such that when a lamp is mounted in the electrical socket only the end of the lamp extends into the reflector whereby, upon installation of a lamp into the electrical socket and connection of the socket to a source of electricity, light is reflected from the ceiling fixture in a substantially glare-free and shadow-free manner.

4,885,666

TOUCHABLY-OPERATING MINIATURE FLASHLIGHT

Chen-Tsung Yu, P. O. Box 10160, Taipei, Taiwan

Filed Jan. 24, 1989, Ser. No. 300,911
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—189 1 Claim

1. A miniature flashlight comprising:

a housing having two battery sockets disposed on a right and a left sides of the housing, a bottom plate formed on a bottom of the housing, an upper plate formed on an upper portion of the housing having a bulb socket formed in a central portion of the upper plate and a recess portion formed in a rear portion of said housing opposite to said two battery sockets;

a bulb detachably mounted in said bulb socket of said housing; two batteries respectively held in said two battery sockets in said housing and electrically connected in series for forming a power circuit between a bulb terminal and a lamp base of the bulb for lighting said bulb;

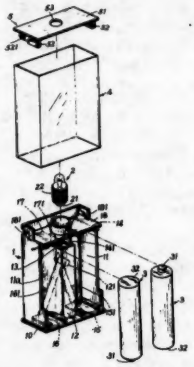
two spring contactor plates normally resiliently open and operatively closed forming a part of said power circuit of said bulb for lighting said bulb;

a flexible sleeve jacketed on said housing; and

a top cover mounted on said upper plate confining said

sleeve between said top cover and said bottom plate, said top cover including a horizontal plate having a central hole for protruding said bulb outwardly, a pair of side plates protruding downwardly from two opposite sides of said horizontal plate each side plate having an extension engageable with a side hole formed in said upper plate of said housing so that said top cover can be mounted on said housing; said housing, said sleeve and said top cover being made of electrical insulating materials, whereby upon a depression of the sleeve on the recess portion, said two spring contactor plates are contacted to close the power circuit for lighting said bulb;

the improvement which comprises: said housing including a first battery socket having a first upper clip formed on an upper portion of the battery socket under the upper plate pertaining a bulb-terminal contactor plate for electrically connecting a bulb terminal, and a first lower clip formed on a lower portion of the battery socket on the bottom plate pertaining an outer spring contactor plate protruding



rearwardly into said recess portion of said housing, said first battery socket having a first battery held therein with a positive terminal of the first battery contacting the first upper clip and a negative terminal of the first battery contacting the first lower clip; and

a second battery socket having a second upper clip formed on its upper portion pertaining a lamp-base contactor plate electrically connecting a lamp base of said bulb, and a second lower clip formed on a lower portion of the second battery socket pertaining an inner spring contactor plate protruding rearwardly into the recess portion of said housing to be fixed on a stem protruding rearwardly from a central partition plate separating the two battery sockets so as to be operatively contacted by said outer spring contactor plate to close the power circuit for lighting said bulb, a second battery held in said second battery socket having a postive terminal of the second battery contacting said second lower clip and having a negative terminal of the battery contacting said second upper clip.

4,885,667

GOOSENECK LAMP AND MAGNIFIER WITH IMPROVED CLAMP ASSEMBLY

Boynton Selden, 81 Uplands Dr., West Hartford, Conn. 06107

Filed Feb. 23, 1989, Ser. No. 314,487
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—253 **10 Claims**

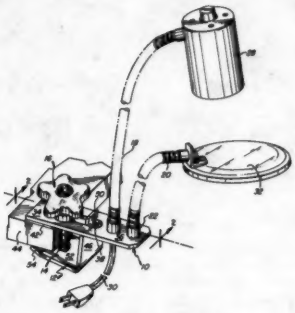
1. In a gooseneck lamp assembly for facile clamping on a table, the combination comprising:

(a) a base member having a clamp portion adjacent one end thereof adapted to overlie the upper surface of the associated table and a mounting portion adjacent the other end thereof, said base member having an axially elongated slot therein intermediate said ends thereof and an aperture said clamp portion forwardly of said slot;

(b) a floating clamp having a generally vertically extending leg portion having its upper end slidably seated in said slot and a clamping leg portion extending forwardly therefrom and having an aperture therein aligned with said aperture in said clamp portion of said base member;

(c) a clamping bolt having a shank extending through said aperture of said clamp portion of said base member and said clamping leg portion of said clamp;

(d) a knob on said shank above said base member threadably engaged with said shank whereby rotation of said knob will effect pivoting of the free end of said clamping portion towards and away from said base member;



(e) coil spring means about said shank of said clamping bolt between said clamp portion and clamping leg portion to bias said clamping leg portion away from said clamp portion;

(f) a flexible gooseneck arm secured at its lower end to said mounting portion of said base member;

(g) a lamp unit at the upper end of said gooseneck arm; and

(h) electrical wiring extending through said base member and gooseneck arm to power said lamp unit,

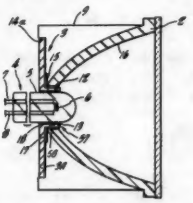
said gooseneck lamp assembly being readily secured to an associated table by fitting the cooperating clamping portions thereover and rotating said knob to pivot said outer end of said clamping leg portion tightly against the lower surface of the associated table.

4,885,668

HEAT SHIELD

Anthony Maglica, Ontario, and Ralph E. Johnson, Los Alamitos, both of Calif., assignors to Mag Instrument, Inc., Ontario, Calif.

Filed Jun. 17, 1988, Ser. No. 208,266
Int. Cl.[4] F21V *7/20*
U.S. Cl. 362—345 **16 Claims**



1. A reflector assembly including:

a reflector body made of a first material and defining a centrally disposed aperture therein; and

a heat shield made of a second material and defining a first portion and a second portion, said first portion having a first outer diameter throughout a major portion of its length and extending into said aperture in said reflector

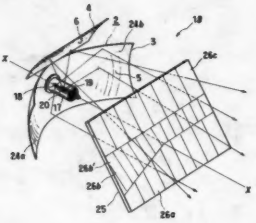
body, said second portion having a second outer diameter throughout a major portion of its length and being disposed behind said reflector body, said second outer diameter being greater than the first outer diameter.

4,885,669

HEADLIGHT DEVICE FOR VEHICLE

Naohi Nino, Shimizu, Japan, assignor to Koito Seisakusho Co., Ltd., Shizuoka, Japan

Filed Oct. 26, 1988, Ser. No. 263,579
Int. Cl.[4] F21V 7/00
U.S. Cl. 362—346 7 Claims



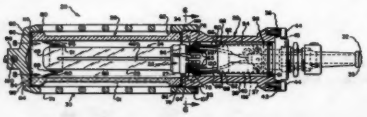
1. A headlight device for use in a vehicle and comprising a reflective mirror which is divided into a first portion being effective to form a light distribution pattern of the central portion, and a second portion being effective to form a light distribution pattern of the left and right side portions, said first portion having in a planar projection the shape of a rectangle elongated in a horizontal direction, said second portion being disposed adjacent a long side of said first portion, said first and second portions producing overlapping light distribution patterns in shapes determined substantially entirely by shapes of said first and second portions.

4,885,670

PORTABLE LAMP

Karl A. Banke, Angola, N.Y., assignor to K & H Industries, Inc., Angola, N.Y.

Filed Apr. 4, 1988, Ser. No. 177,127
Int. Cl.[4] F21L 15/12
U.S. Cl. 362—400 7 Claims



1. A portable electric lamp comprising:

an elongated electric bulb having a light-generating portion and a current-receiving portion at an end of the bulb;

means defining an elongated hand grip having two opposite ends;

means associated with the hand grip for supporting the bulb at one end of the hand grip, the bulb-supporting means adapted to cooperate with the current-receiving portion of the electric bulb and to thereby maintain the bulb in such a relationship with the hand grip that the light generating portion of the bulb extends generally axially of and from said one end of the hand grip;

an elongated transparent tube positioned about the light-generating portion of the electric bulb and which is transparent to light generated thereby;

means defining an elongated tubular protector element having a protector body positioned about the transparent tube and cooperating with the hand grip to maintain the transparent tube in position about the light-generating portion of the electric bulb, said protector body comprising an integral cast structure and defining a side opening therein through which light generated by the light-generating portion of the bulb is transmitted out of the protector element;

said cast protector body being generally cylindrical in shape and including a plurality of spaced cast ribs extending across the side opening of said body, each of the ribs being arranged generally in a radial plane of the protector body so as to span the side opening therein and so that light generated by the bulb is transmitted out of the protector element through the spacing defined between the ribs, said side opening having a length measured axially along said tubular protector element and said ribs being spaced relatively close together along the length of said opening, said protector element including at least one cast strenghtening strut extending across the spacing between each pair of adjacent ribs and which is joined integrally at its opposite ends to the adjacent ribs; and

conducting means operatively connected to said bulb-supporting means for routing current from a power source to the current-receiving portion of the bulb.

4,885,671

PULSE-BY-PULSE CURRENT MODE CONTROLLED POWER SUPPLY

William Peil, North Syracuse, N.Y., assignor to General Electric Company, Philadelphia, Pa.

Filed Mar. 24, 1988, Ser. No. 172,606
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—17 22 Claims

1. A power supply apparatus for supplying power to an arc-discharge load from an input supply voltage, the power supplied to the load manifesting itself as an output supply voltage and an output supply current at the load, comprising:

sense signal generating means for generating a sense signal that is indicative of a corresponding level of said output supply voltage and current;

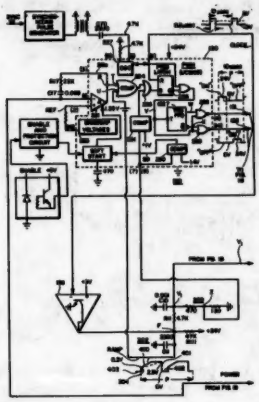
a source of an oscillatory signal;

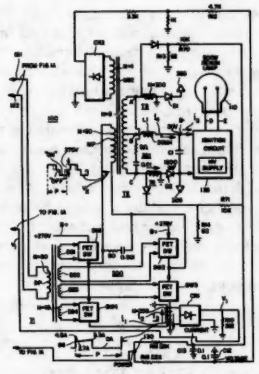
pulse-width-modulator (PWM) means coupled to the sense signal generating means and responsive to said sense signal, the PWM means for generating a pulsating drive signal having a pulse width that varies in response to said sense signal;

power switch means responsive to said drive signal and for coupling to said load for generating in said load said output supply current that is periodic and pulsating with a pulse width that varies in accordance with that of said drive signal such that a change in said sense signal causes the pulse width of a corresponding pulse of said output supply current to change in a negative feedback manner;

lowpass filter means responsive to an input signal that is indicative of said pulsating output supply current for generating at an output of said filter a ramping first portion of each pulse of a pulsating control signal the first portion ramping from a first predetermined value toward a second predetermined value and having a slope that is determined in accordance with a magnitude of said output supply current on a pulse-by-pulse basis, said slope having an average slope that is established by a cutoff frequency of said lowpass filter, said pulsating control signal being coupled to said PWM means for controlling the pulse width of a corresponding pulse of said drive signal such that a given change in said magnitude of said corresponding pulse of said output supply current from a steady state magnitude thereof will cause said lowpass filter to vary said slope of said first portion, on said pulse-by-pulse basis, that in turn, for a given level of said sense signal, causes the width of said corresponding pulse of said output supply current to change in a negative feedback manner, for reducing said given change in said magnitude of said corresponding pulse of said output supply current; and

means responsive to said oscillatory signal and coupled to said filter for generating a second portion of each pulse of





said pulsatory control signal, the second portion directed toward the first predetermined value.

4,885,672

VOLTAGE REGULATING DEVICE

Satoshi Watanabe, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Nov. 28, 1988, Ser. No. 276,778
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **5 Claims**

1. A voltage regulating device comprising:

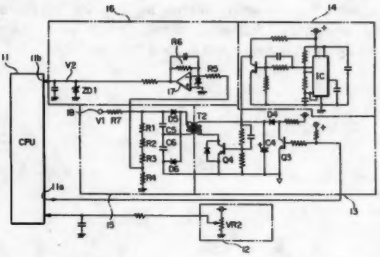
designation means for generating a target signal having a preset level related to a selected target voltage;

processing means responsive to the target signal for generating an analog process signal related to the target signal;

a signal generating means for generating a signal to modify the analog process signal;

a feedback circuit means for providing to said processing means a feedback signal corresponding to the analog process signal, said processing means being coupled to the signal generating means for, in response to the feedback signal, modifying the analog process signal to maintain it at the preset level;

wherein, said processing means includes means to choose one of a plurality of preprogrammed target ranges in accordance with the target signal from said designation



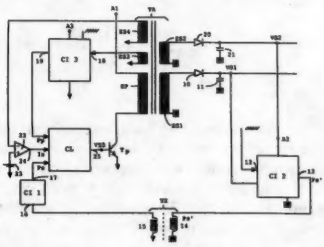
means, so that when the feedback signal moves out of said target range, said processing means judges the feedback signal as being abnormal and generates a control signal.

4,885,673

DEMAGNETIZATION MONITORING DEVICE FOR A SWITCHING POWER SUPPLY WITH A PRIMARY AND A SECONDARY REGULATION

Maige Philippe, Seyssinet Parizet, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

Filed Jan. 23, 1989, Ser. No. 301,525
Claims priority, application France, Jan. 21, 1988, 88 00885
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **3 Claims**



1. A switching power supply comprising a primary regulation system (CI3) and a secondary regulation system (CI2, CI1), each of said systems being capable of supplying at the output (19, 17) signals (Pp, Ps) constituted by periodical square pulses of variable widths liable to be set to a first logic state ("0") corresponding to a switching off order of a main switch (Tp) and to a second logic state ("1") corresponding to a switching on order of this main switch, further comprising:

a comparison means (22), with respect to a low or null voltage value (23), for the output voltage (VS4) of a secondary winding (ES4), the output of the comparison means (22) supplying a signal (Is) being set to said second logic state "1") when the transformer and to said first logic state ("0") when said transformer is not demagnetized

a logic circuit (CL) receiving the output signal (Is) of the comparison means (22), the output signal (Pp) of the primary regulation system and the output signal (Ps) of the secondary regulation system, this logic circuit supplying at its output (25) a control signal (VS5) of the main switch (Tp) which can be set to said first logic state ("0") for the switching OFF of the main switch or said second logic state ("1") for its switching ON, as a function of the following criteria:

the control signal is set to said second logic state ("1") if the output signal of the comparator is set to said second logic state ("1") and if the output signal of at least one of the regulators is set to said second logic state ("1"),

the control signal is set to said first logic state ("0") when the output signal of the regulator which has caused the control signal to be set to said second logic state ("1") is reset.

4,885,674

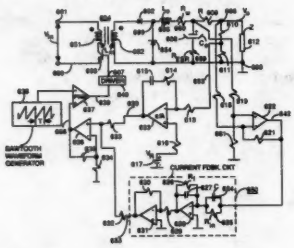
SYNTHESIS OF LOAD-INDEPENDENT SWITCH-MODE POWER CONVERTERS

Ljubomir D. Varga, Deskaseva 6, 11000 Beograd, Yugoslavia, and Novica A. Losic, 7802-23 Ave., Kenosha, Wis. 53140

Continuation of Ser. No. 174,148, Mar. 28, 1988, abandoned. This application Jun. 12, 1989, Ser. No. 366,232

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—21 **9 Claims**



1. A method for synthesizing load independent switching power converters of buck or buck derived type comprising:

accepting a source of electrical energy of a constant voltage or a feedforward compensated voltage at an input,

coupling through an output filter to a load to be energized at an output controlling a power flow from said input to said output,

periodically enabling a power semiconductor switch for the control of said power flow,

supplying a resultant control voltage signal for periodically enabling said power semiconductor switch,

sampling a voltage across said load,

sensing a current through said load,

feeding back the sampled voltage signal in a negative feedback loop with respect to a reference voltage source and summing the two voltages passing a signal obtained as the algebraic sum of the sampled voltage and the reference voltage through a stabilizing network; thereby producing an error voltage signal proportional to a difference between the two voltages,

feeding back the sensed current signal through a current feedback circuit in a positive feedback loop with respect to said error voltage signal and summing the two signals,

supplying said resultant control voltage signal, obtained as the sum of said error voltage signal and the current signal fed through said current feedback circuit, for periodically enabling said power semiconductor switch for the control of the flow of power from the input source to the output load, whereby said voltage across said load is made independent of said load.

4,885,675

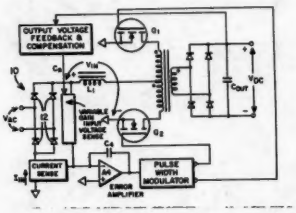
TRANSFORMER ISOLATED AC TO DC POWER CONDITIONER WITH RESISTIVE INPUT CURRENT

Christopher P. Henze, Eagan, Minn., and James A. Smith, Hudson, Wis., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 7, 1988, Ser. No. 254,635

Int. Cl.[4] H02M *3/337*; G05F *1/70*

U.S. Cl. 363—26 **2 Claims**



1. An AC to DC power conditioner comprising first and second switching means having first and second controllable current-path means and first and second control means, respectively, for controlling said first and second controllable current-path means, respectively, output transformer means comprising a center tapped primary winding having a first winding section of one polarity coupled in series with said first controllable current-path means and a second winding section of an opposite polarity coupled in series with said second controllable current-path means, inductance means coupled to the center tap of said primary winding and to a source of AC input voltage, pulse width modulation means coupled to supply first and second pulse width modulated control signals to said first and second control means, respectively, drive means for driving said pulse width modulation means as a function of an error signal, variable gain input voltage sense means and input current sense means for developing first and second signals which are combined to form said error signal, and which are respectively proportional to the instantaneous average input voltage and the instantaneous average input current to said power conditioner.

4,885,676

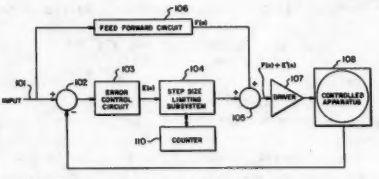
CONTROL LOOP INSTABILITY DETECTION AND CORRECTION APPARATUS

James Zweighaft, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Mar. 10, 1988, Ser. No. 166,262

Int. Cl.[4] G05B *21/02*

U.S. Cl. 364—178 **15 Claims**



1. In a digital control system that, on a periodic sampling interval basis, regulates the operation of a controlled apparatus, a method of providing control loop stability comprising the steps of:

periodically sampling said controlled apparatus to compare the state of said controlled apparatus in the present sampling interval with the expected state of said controlled apparatus;

generating an error control signal to adjust the operation of said controlled apparatus;

calculating the difference between said error control signal for the present sampling interval and said error control signal for the previous sampling interval; and

reducing said error control signal for the present sampling interval to equal the error control signal for the previous sampling interval plus a predetermined maximum step size when said difference exceeds said predetermined maximum step size.

4,885,677

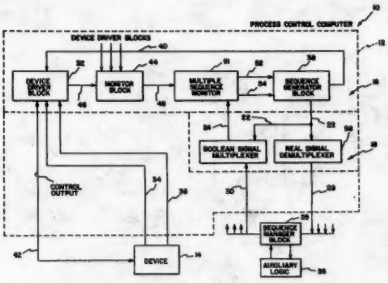
AUTOMATIC SYSTEM FOR SEQUENTIAL CONTROL AND FAULT DETECTION OF DEVICES USED IN BATCH PROCESSES

Thomas R. Heilman, Willoughby, and David M. Norris, Kirtland, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 65,976, Jun. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 887,506, Jul. 21, 1986, abandoned. This application May 15, 1989, Ser. No. 355,143

Int. Cl.[4] G06F *15/00*

U.S. Cl. 364—184 **4 Claims**



1. A device driver function block unit (32) for controlling and monitoring the operation of a discrete device (14), comprising:

means for receiving a boolean control signal (40);

means for outputting (42) and control signal to said discrete device (14);

means for receiving a feedback signal (34, 36) from said discrete device (14);

means (Boolean Mask) for providing a reference signal;

means for comparing said feedback signal (34, 36) with said reference signal (Boolean Mask) to determine whether the discrete device (14) completed its operation successfully without a malfunction or breakdown; and

means for continuously outputting (Boolean Filter) a real signal (46) indicative of the operating status of said discrete device (14) based on said comparison.

4,885,678

VECTOR PROCESSOR FOR PROCESSING DATABASE WITHOUT SPECIAL TAGS FOR VECTOR ELEMENTS

Keiji Kojima, Kodaira; Shunichi Torii, Musashino, and Akiharu Sakata, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 124,923

Claims priority, application Japan, Nov. 28, 1986, 61-281719

Int. Cl.[4] G06F *15/347*

U.S. Cl. 364—200 **7 Claims**

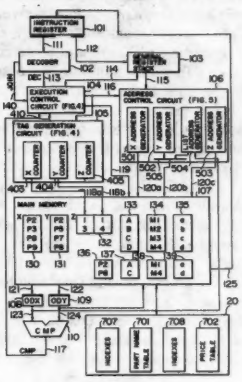
1. A vector processor comprising:

a memory for storing vector data;

first means, connected to said memory, for sequentially fetching elements of a first vector data to be processed, for said memory;

second means, connected to said first means, for processing elements fetched by said first means;

third, means for generating plural tag information, each such tag information designating a corresponding one of the fetched vector elements in synchronism with the fetching; and



fourth means, connected to said first, second, and third means, for writing the information generated by said third means for one of the fetched elements into said memory as an element of a second vector data in response to a predetermined process result obtained by said third means for said one fetched element.

4,885,679

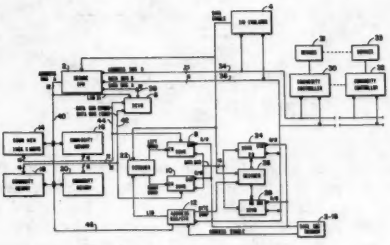
SECURE COMMODITY BUS

Raymond J. Webster, Jr., Groveland, and Joseph G. DiChiara, Burlington, both of Mass., assignors to BULL HN Information Systems Inc., Billerica, Mass.

Filed Dec. 21, 1987, Ser. No. 136,079

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **6 Claims**



1. A data processing system comprising:

a central unit (CPU);

system memory data storage means for storing data;

a memory bus, the CPU and system memory data storage means being connected to the memory bus, the CPU issuing read and write memory commands to the system memory data storage means to read data from and to write data into the system memory data storage means;

peripheral controller means;

peripheral data storage means for storing data connected to the peripheral controller means;

I/O emulator means, the I/O emulator means including emulator data storage means for storing data;

an I/O bus, the peripheral controller means, I/O emulator means and CPU being connected to the I/O bus;

transceiver means connected to the I/O bus and the memory bus for transmitting data between the I/O bus and the memory bus when enabled by a data enable signal;

said CPU initiating transfer of data between the system memory data storage means and the peripheral data storage means by issuing I/O read and write commands over the I/O bus to the I/O emulator, each such command identifying the data to be transferred, the data storage means in which said data is stored, and the data storage means to which it is to be transferred and stored; the I/O emulator in response to an I/O command received from the CPU, issuing emulator commands to transfer the data identified by the CPU's I/O command from the data storage means in which said data is stored to the emulator data storage means for storage therein; and for issuing emulator commands to transfer the data stored in the emulator data storage means to the data storage means specified by the I/O command into which said data is to be stored; said I/O emulator producing a data enable signal and applying the data enable signal to the transceiver means when data is transferred between the emulator data storage means and the system memory data storage means via the transceiver means.

4,885,680

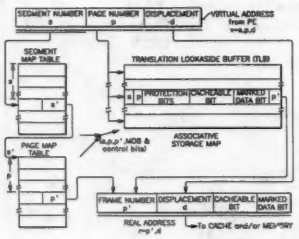
METHOD AND APPARATUS FOR EFFICIENTLY HANDLING TEMPORARILY CACHEABLE DATA

John H. Anthony, Danbury, Conn.; William C. Brantley, Jr., Mount Kisco, N.Y.; Kevin P. McAuliffe, Yorktown Heights, N.Y.; Vern A. Norton, Croton-on-Hudson, N.Y., and Gregory F. Pfister, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 25, 1986, Ser. No. 890,428

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **18 Claims**



1. In a high speed electronic multiprocessor computer system comprising a plurality of separate processing elements (PE), each having associated therewith a high speed cache memory and a large shared main memory accessible to each PE and its, associated cache, and to other PE's and caches in the system, each cache memory including a control mechanism and a cache directory accessible to its local PE said cache directory containing the addresses of all data lines currently stored in the cache memory, said cache memory and main memory being operable under the control of a memory management procedure including a method for managing temporarily cacheable data resident in each cache serving its associated processor in which each processor can invalidate the temporarily cacheable data in its associated cache with a single instruction, said instruction being applied to temporarily cacheable data independently of the ranges of addresses of the temporarily cacheable data, the method comprising

associating a marked data bit (MDB) field with a data line of temporarily cacheable data, through the steps of

accessing a data line from main memory after a cache miss,

concurrently accessing the associated marked data bit (MDB) field which indicates that the data line to which the MDB refers is temporarily cacheable data when the MDB is set to a first binary state,

storing said MDB in the cache directory at the line address where the data line referenced by the MDB is stored, and

selectively invalidating all lines in the cache having their MDBs set to said first binary state in response to a single invalidate MDB instruction received from the PE which is served by the particular cache memory.

4,885,681

I/O EXECUTION METHOD FOR A VIRTUAL MACHINE SYSTEM AND SYSTEM THEREFOR

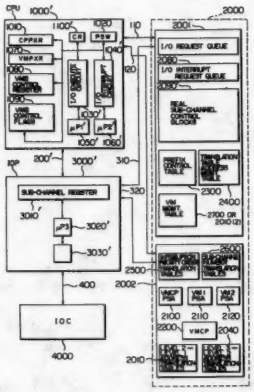
Hidenori Umeno, Kanagawa; Takashige Kubo, Hachioji; Nobutaka Hagiwara, Fujisawa; Hiroaki Sato, and Hideo Sawamoto, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 16, 1985, Ser. No. 691,909

Claims priority, application Japan, Jan. 18, 1984, 59-5587

Int. Cl.[4] G06F *9/46, 12/08*

U.S. Cl. 364—200 **12 Claims**



1. In a computer system for realizing virtual machine system by concurrently running a plurality of operating systems under control of a virtual machine control program, wherein the computer system includes (1) a plurality of I/O devices each being either dedicated to one fo the operating systems or shared by plural ones of the operating systems, (2) I/O instruction execution means for controlling start of an I/O operation of one of the I/O devices designated by a start I/O instruction issued by a running operating system and (3) an I/O processor for controlling execution of the I/O operation of the one I/O device, an I/O execution method for the virtual machine system comprising the steps of:

storing a flag for a respective I/O device indicative of whether the respective I/O device is dedicated to one of the virtual machines to be run on the computer system and storing a VM identifier for a respective I/O device which is dedicated to a respective one of the virtual machines and indicative of the one virtual machine, wherein the storing of the flag and the VM identifier is carried out under control of the virtual machine control program;

storing, as address translation information to be used by said I/O processor for a respective I/O device which is dedi-

cated to a respective virtual machine, address translation information predetermined for the virtual machine so as to translate addresses of a main memory of the virtual machine into addresses of a main memory of the computer system, which addresses of the main memory of the virtual machine are required for execution of instructions by the virtual machine, wherein the selection is carried out under control of the virtual machine control program;

accessing, in response to a start I/O instruction issued from an operating system running one of the virtual machines, a flag and a VM identifier already stored for an I/O device designated by the start I/O instruction, wherein the accessing is carried out by means of said I/O instruction execution means, which responds to the start I/o instruction without intervention of the virtual machine control program to determine whether the designated I/O device designated is dedicated to the running operating system, depending on a value of the accessed flag and VM identifier, wherein the determination is carried out by means of the I/O instruction execution means in response to the start I/O instruction;

producing an order for ordering said I/O processor to execute an I/O operation designated by the start I/O instruction when the I/O device had been determined as being dedicated to the running operating system, wherein the producing is carried out by means of said I/O instruction execution means in response to the start I/O instruction, without intervention of the virtual machine control program;

accessing address transformation information stored for the designated I/O device;

translating addresses of channel commands, indicated by the start I/O instruction and data addresses included in the channel commands using the accessed address translation information, into addresses of the main memory of the computer system; and

executing the I/O instruction, by controlling execution of an I/O operation designated by the start I/O instruction by the designated I/O device, wherein the accessing, translation and executing is carried out by said I/O processor in response to the produced order, without intervention of the virtual machine control program.

4,885,682

MICROPROGRAM CONTROLLER FOR DETECTING THE OCCURRENCE OF AN INTERRUPT REQUEST OR A TERMINATION OF A STRING INSTRUCTION

Yasuhiko Komoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 1, 1987, Ser. No. 127,493

Claims priority, application Japan, Dec. 1, 1986, 61-286936

Int. Cl.[4] G06F *9/30*

U.S. Cl. 364—200 **10 Claims**

1. A microprogram controller comprising:

storing means for storing a plurality of series of microinstructions for executing respective macroinstructions, at least one series of said plurality of series of microinstructions including a chain of microinstructions to be executed repeatedly, said chain of microinstructions containing therein a compound conditional branch microinstruction,

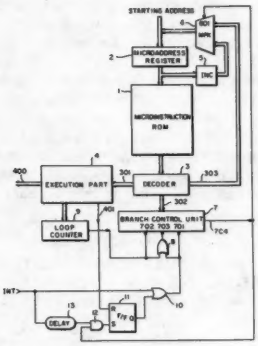
reading means, coupled to said storing means and responsive to a macroinstruction to be executed, for reading an associated series of microinstructions from said storing means,

executing means coupled to said storing means for executing said associated series of microinstructions read from said storing means, said executing means including producing means for producing an execution end signal when an execution of said chain of microinstructions is repeated a predetermined number of times,

an interrupt terminal supplied with an interrupt request signal,

an OR gate, coupled to said producing means and to said interrupt terminal, producing an active level at an output node of said OR gate when at least one of said execution end signal and said interrupt request signal is supplied to said OR gate,

said executing means further including detecting means, coupled to said OR gate and responsive to said compound conditional branch microinstruction, for detecting a level of said output node of said OR gate and for outputting a detection signal when said OR gate produces said active



level, and generating means responsive to said compound conditional branch microinstruction for generating a branch address, and

means, coupled to said detecting means and to said generating means and responsive to said detection signal, for supplying said branch address to said storing means to enable a microinstruction stored at said branch address of said storing means to be read.

4,885,683

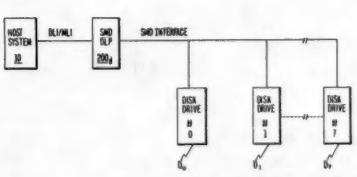
SELF-TESTING PERIPHERAL-CONTROLLER SYSTEM

Ronald S. Coogan, Trabuco Canyon, Calif., assignor to Unisys Corporation, Pa.

Continuation of Ser. No. 780,762, Sep. 27, 1985, abandoned. This application Sep. 12, 1988, Ser. No. 244,564

Int. Cl.[4] G06F *12/00*

U.S. Cl. 364—200 **10 Claims**



1. In a data transfer network wherein a single peripheral-controller, having self-test capabilities, manages data transfers between a main host computer and selected ones of a plurality of disk drive storage modules having differing data parameters and format protocol characteristics, said peripheral-controller comprising:

(a) host interface control means for receiving and storing I/O commands from said host computer and transmitting a elected one of said I/O commands to a formatter control means; said I/O command including a particularly addressed disk drive module and Read and Write instructions; said host interface control means including:

(a1) means to transfer information data between said host computer and said formatter control means;

(b) said formatter control means for receiving said selecting one of said I/O commands and for accessing an attribute

table PROM which specifies the available sector numbers (beginning and ending addresses), number of heads per drive, and number of bytes per track for the addressed disk drive module; said formatter control means including:

(b1) said attribute table PROM for storing said data parameters and format protocol characteristics of each of said plurality of disk drive modules;

(b2) means to transfer said information data between said host interface control means and a disk module interface means according to said data parameters and format protocol characteristics derived from said attribute table PROM;

(c) said disk module interface means for establishing the identity of the selected disk drive module and for enabling Read/Write data transfers between said selected disk module and said formatter control means;

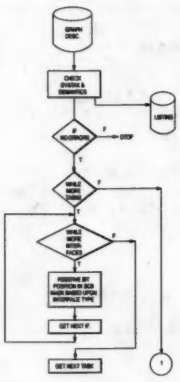
(d) means for initiating and executing a self-test operation of said host interface control means, of said formatter control means and said disk module interface means.

4,885,684

METHOD FOR COMPILING A MASTER TASK DEFINITION DATA SET FOR DEFINING THE LOGICAL DATA FLOW OF A DISTRIBUTED PROCESSING NETWORK

Edward B. Austin, Woodbridge, and Jeffrey E. Robertson, Manassas, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 7, 1987, Ser. No. 129,269
Int. Cl.[4] G06F *9/44*
U.S. Cl. 364—300 **6 Claims**



1. For a distributed processing system including a plurality of distributed data processing elements, each of which having a local operating system for controlling operations therein and each having an associated storage means for storing at least one control block for defining functions to be performed by a data processing element in accordance with its local operating system, said plurality of data processing elements being interconnected by a data bus and a control bus, a method for compiling a master task definition data set for defining a logical data flow of said distributed processing system for accomplishing a specific complex function, comprising the steps of:

inputting a user defined task description in a form of a high level language instruction which specifies what the task does, which other tasks a given task is associated with, and on what data processing element the given task is executed;

providing control blocks of three different types, a first type for controliing execution of tasks within said data processing element, a second type controlling transfer of data between tasks, and a third type controlling interdependent tasks by sending control tokens between tasks;

assembling addresses and routing information in control blocks to enable interconnection of tasks, as specified in a master task definitional data set;

assembling user defined parameters in a master task definition data set, into respective control blocks;

assembling a dependency mask in respective control blocks defining the tokens necessary to authorize execution of a task;

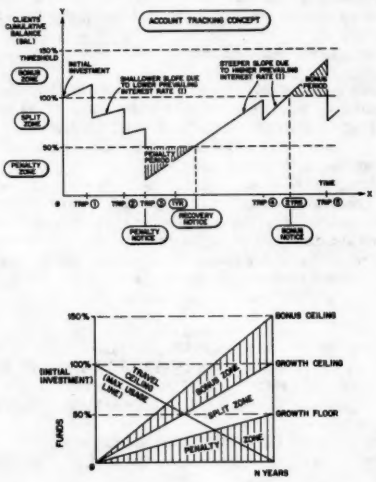
outputting a bit map representation of a plurality of control blocks, to enable said distributed processing system to carry out said specific complex function.

4,885,685

INVESTMENT MANAGEMENT SYSTEM WITH TRAVEL USAGE FUNDS INDEXED TO CUSTOMER ACCOUNT STATUS

Larry Wolfberg, Honolulu, Hi.; Brent Wolfberg, Los Angeles, Calif., and Jan E. Rhoads, Virginia Beach, Va., assignors to L & C Family Partnership, Honolulu, Hi.

Filed Sep. 18, 1987, Ser. No. 98,631
Int. Cl.[4] G06F *15/30*
U.S. Cl. 364—401 **74 Claims**



1. An air travel tracking data processing system comprising:

data entry means for entering air travel related data and client identification data, said air travel related data including air travel usage data;

memory means for storing instructions and for storing travel related data in a plurality of client account files, each of said client account files containing an indication of the amount of funds available for travel and client investment growth related data;

control means for executing said instructions and for processing said data, said control means including means for associating said entered air travel related data with a corresponding one of said plurality of client account files in accordance with said client identification data, and means for updating client account files in accordance with said entered travel related data for maintaining cumulative travel related data in each of said account files;

said means for updating including means responsive to said entered travel related data for updating said indication of the amount of travel funds available in a corresponding

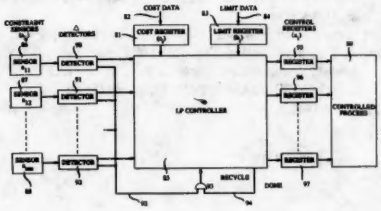
one of said account files in accordance with travel usage data and said investment growth related data.

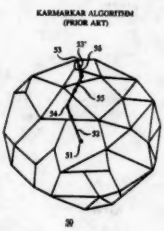
4,885,686

METHODS AND APPARATUS FOR EFFICIENT RESOURCE ALLOCATION

Robert J. Vanderbei, Red Bank, N.J., assignor to American Telephone and Telegraph AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 12, 1987, Ser. No. 2,371
Int. Cl.[4] G06F *15/20*; H04Q *3/66*; H04M *7/00*
U.S. Cl. 364—402 **11 Claims**





1. A method for allocating available industrial facilities among users of said facilities, subject to constraints on said allocations, to minimize the total cost of providing said facilities, said method starting with a initial tentative facilities assignment and comprising the steps of:

tentatively assigning said available facilities to said users in accordance with a specified deterministic process to form a tentative facilities assignment characterized by a total cost that is lower than the cost of preceding tentative facilities assignments;

repeating said step of tentatively assigning when said total cost fails to meet a preselected criterion; and

allocating said facilities in accordance with the last of said tentative facilities assignments when said total cost meets said preselected criterion;

wherein

said allocations to said users and said available industrial facilities form linear constraint relationships; and

said preselected deterministic process is a modified Karmarkar algorithm wherein

each said assignment is determined by normalizing the previous assignment with respect to constraints on said allocations,

during each said assignment, forming a tentative facilities assignment by (a) separating said constraint relationships into a sum of a first subset of constraint relationships and a second subset of constraint relationships, where said first subset of constraint relationships corresponds to those users that affect a number of said constraints in excess of a preselected proportion of said constraints, and said second subset of constraint relationships corresponds to the remaining users, and (b) separately operating on said subsets of constraint relationships in the course of said assignment.

4,885,687

TRACKIG INSTRUMENTATION FOR MEASURING HUMAN MOTOR CONTROL

James R. Carey, St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 861,052, May 8, 1986, abandoned. This application Oct. 13, 1988, Ser. No. 257,194
Int. Cl.[4] A61B *5/10*
U.S. Cl. 364—413.02 **7 Claims**

1. Tracking instrumentation for measuring human motor control comprising:

digital computer means;

monitor means for displaying graphics in response to said computer means;

load cell means for converting a force exerted by one or more muscles into a corresponding proportional electrical signal;

analog-to-digital convertor means for periodically sampling and converting said electrical signal into a series of digital words, each word representing a force amplitude value at a given moment;

software means operable in said computer for:

(a) causing said computer means to generate a predetermined pattern on said monitor;

(b) receiving said words in real time from said convertor means and scaling said represented force amplitude values according to a predetermined scaling factor for display on said monitor; and

(c) plotting scaled values on said monitor superimposed on said pattern, said values being plotted according to the moment acquired so that the user may adjust said force in an attempt to track said pattern as said plotted values sweep across said monitor;

said software means further including means for recording said words and for analyzing the deviation of the corresponding scaled values to determine a normalized accuracy indication value quantifying tracking performance, said analyzing means including means for:

(a) calculating a first root mean square difference between said pattern and said values representing force amplitude;

(b) calculating a second root mean square difference between said pattern and a baseline, said baseline corresponding to a zero level from said load cell means; and

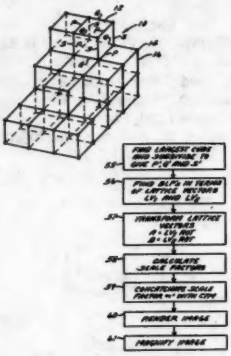
(c) calculating said normalized accuracy indication values as a function of the ratio between said first root mean square difference and said second root means square difference.

4,885,688

MINIMIZATION OF DIRECTED POINTS GENERATED IN THREE-DIMENSIONAL DIVIDING CUBES METHOD

Carl R. Crawford, Milwaukee, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Nov. 25, 1987, Ser. No. 125,510
Int. Cl.[4] G06F *15/62, 15/68;* G09G *1/16*
U.S. Cl. 364—413.22 10 Claims



6. A method for generating a three-dimensional image of an object from a plurality of slices of tomographic data, said method comprising the steps of:

defining boundaries of said object within said data;

matching said boundaries to a predetermined pixel array to define a 3-D pixel size;

interpolating said data according to interpolation factors that give subdivided data spacings which are related to said 3-D pixel size by a multiplier in the range of about $1/\sqrt{2}$ and higher; and

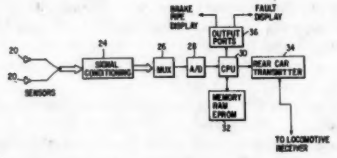
extracting a surface definition of said object from said interpolated data.

4,885,689

MULTILINGUAL CODE RECEIVERS

Mark E. Kane; James F. Shockley, and Henry H. Eck, all of Montgomery County, Md., assignors to Pulse Electronics, Inc., Rockville, Md.

Filed Apr. 22, 1987, Ser. No. 41,089
Int. Cl.[4] B61L *3/00;* B61B *13/16*
U.S. Cl. 364—424.01 7 Claims



1. A multilingual code receiver for use with end-of-train telemetry systems, said receiving means receiving and correctly decoding different data message formats from a remotely located end-of-train telemetry transmitter, said receiver comprising:

radio frequency receiving means for receiving data from said remotely located end-of-train telemetry transmitter;

means connected to said radio frequency receiving means for scanning a bit stream of said received data and determining which of said different data message formats has been received;

means responsive to said scanning means for extracting data from the received data message according to a detected data message format as determined by said scanning means; and

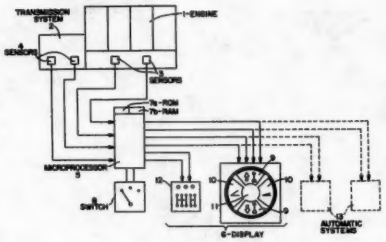
means for decoding and processing extracted data.

4,885,690

SYSTEM FOR OPTIMIZING DRIVING PARAMETERS IN UTILITY VEHICLES

Johannes Schimmel; Harald Bauer; Gunther Burian; Heinz Hulla, all of Steyr; Robert Kagerer, Neuzeug, and Helmut Kubin, Steyr, all of Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria

Continuation-in-part of Ser. No. 696,041, Jan. 29, 1985, abandoned. This application Sep. 23, 1987, Ser. No. 100,163
Claims priority, application Austria, Feb. 1, 1984, 319/84
Int. Cl.[4] G05D *13/58;* F16H *5/52;* F02D *43/04*
U.S. Cl. 364—424.1 4 Claims



1. A device for optimizing the driving parameters of a farming tractor for use with an agricultural implement, said tractor including an engine having an engine rotational speed controllable by an operator of said tractor and an engine power output, said tractor also including a transmission having a gear position controllable by said operator of said tractor and a rotational speed at its output, said device comprising

a processor,

switch means associated with said processor for enabling an operator of said tractor to select between first and second ranges of engine rotational speed and engine power output, said first and second ranges of engine rotational speed and engine power output corresponding to optimized fuel use and optimized work output per unit time, respectively,

memory means associated with said processor for storing data corresponding to said first operating range and data corresponding to said second operating range, in response to said switch means said processor obtaining from said memory the data corresponding to the selected operating range,

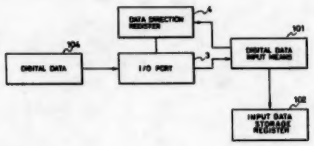
sensing means for sensing data concerning the actual rotational speed and load of said engine and the actual rotational speed and gear position of said transmission and for communicating said sensed data to said processor, said processor processing said sensed data and said data stored in said memory corresponding to said selected operating range to determine how said engine rotational speed and said gear position should be adjusted by said operator to bring said tractor into said selected operating range, and

indicator means responsive to said processor for indicating to said operator how said engine rotational speed and said gear position should be adjusted by said operator to bring said tractor into said selected range to optimize performance with respect to fuel consumption or work output per unit time.

4,885,691
MICROCOMPUTER APPLIED CONTROL UNIT FOR USE IN A VEHICLE

Mitsuaki Ishii; Masaaki Miyazaki, and Takahiro Matsunaga, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 124,519
Claims priority, application Japan, Nov. 24, 1986, 61-280408
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—424.04 **4 Claims**



1. A microcomputer applied control unit for a vehicle, comprising:

an input/output port for reading and writing data;

a data direction register for setting the input/output direction of said input/output port;

a read only memory for storing instructions;

a central processing unit for sequentially processing instructions stored in said read only memory;

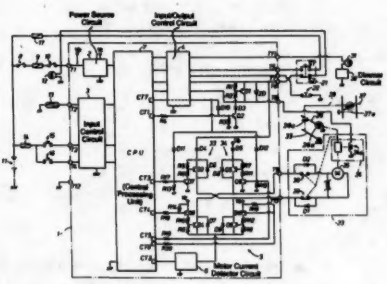
digital data input means for setting said data direction register each time and immediately before said digital data input means reads digital data via said input/output port; and

an input data storage register for storing the data inputted by said digital data input means via said input/output port for operational processing by said central processing unit.

4,885,692
CRUISE CONTROL SYSTEM

Norimitsu Kurihara, and Masahiko Asakura, both of Saitama, Japan, assignors to Honda Giken Kogyo K.K. and Mitsuba Electric Mfg. Co. Ltd., both of, Japan

Filed Aug. 18, 1988, Ser. No. 233,641
Claims priority, application Japan, Aug. 20, 1987, 62-207244
Int. Cl.[4] B60K *31/04*
U.S. Cl. 364—426.04 **7 Claims**



1. A vehicle cruise control system, comprising:

a control circuit for producing a control signal for maintaining a speed of a vehicle at a fixed level according to a difference between an actual vehicle speed and a target vehicle speed;

a driver circuit for producing a drive current for selectively driving an actuator for acting upon vehicle speed control means of said vehicle in a direction either to accelerate said vehicle or to decelerate said vehicle according to said control signal from said control circuit;

a limit switch for detecting a limit of a deceleration stroke of said vehicle speed control means; a disabling means for disconnecting a path of supplying said drive current from said driver circuit to said actuator upon detection of said limit;

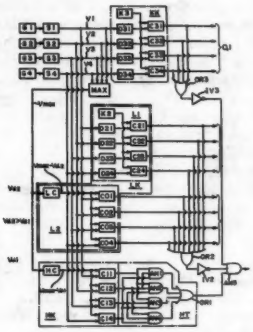
current detecting means for detecting said drive current supplied to said actuator;

self diagnosis means connected to receive said drive current for supplying a test control signal for moving said actuator to drive said vehicle speed control means to said limit of the deceleration stroke to said driver circuit, and canceling the operation of said cruise control system if said test control signal has failed to cause said limit switch to detect said limit of the deceleration stroke.

4,885,693
WHEEL-SLIP DETECTION SYSTEM

Asaji Imanaka; Tatsuo Fujiwara, both of Kobe, and Shuichi Osaka, Osaka, all of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Continuation of Ser. No. 834,295, Feb. 27, 1986, abandoned.
This application Sep. 19, 1988, Ser. No. 245,493
Claims priority, application Japan, Feb. 27, 1985, 60-39912
Int. Cl.[4] B60T *8/58*
U.S. Cl. 364—426.02 **19 Claims**



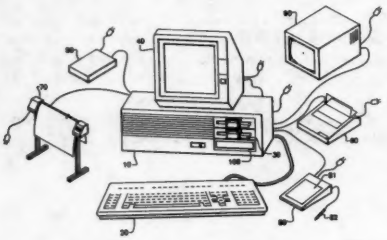
1. A wheel-slip detection system comprising, a first means for establishing a first velocity set point; a second means for establishing a second velocity set point which is higher than the first velocity set point; a third means for determining that at least one wheel axle is slipping when the velocity difference of any two or more wheel axles exceeds the first velocity set point, and also when the velocity difference of two or more axles is less than the second velocity set point, and also when an acceleration obtained by differentiating the velocity of each wheel axle is less than a standard acceleration; and slip-detection means for detecting the velocities of the n wheel axles where n is an integer of more than three (3) and for determining the velocity difference of each wheel axle by comparing the velocity of each wheel axle to a standard velocity, said slip-detection means detects which is the highest velocity among the n wheel axles to produce the standard velocity and which determines the wheel axles are slipping when the difference of the velocity of each wheel axle exceeds the second velocity set point.

4,885,694

AUTOMATED BUILDING CONTROL DESIGN SYSTEM

Robert H. Pray, Minneapolis; Donald W. Ramler, Cottage Grove, and Curtis B. Juliber, St. Paul, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 29, 1987, Ser. No. 44,079
Int. Cl.[4] G06F *15/60*
U.S. Cl. 364—464.01 101 Claims



1. A computer system for substantially automating the design of a building control system, comprising:

(a) processor means for processing data stored in a data base wherein the data is related to a building control system design and comprises both graphic and alphanumeric information, including building control device symbols and textual descriptions of the building control system requirements and information related to labor and material costs;

(b) display means comprising a first display for displaying textual portions of the data and a second display for performing graphic drawing with associated commands;

(c) the processor means comprising means for calling up on the display an initial drawing related to a building control system element, the initial drawing comprising graphic and related alpha-numeric information including an identifier associated with the element and a prompt guiding modification of the initial drawing; and

(d) the processor means further comprising means for creating a modified drawing by incorporating changes into the initial drawing and means for estimating costs related to the building control system design wherein the modified drawing is related to a building control system design.

4,885,695

NUMERICAL CONTROL DEVICE WITH GENERAL PURPOSE SETTING DISPLAY

Akihiko Fujimoto, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

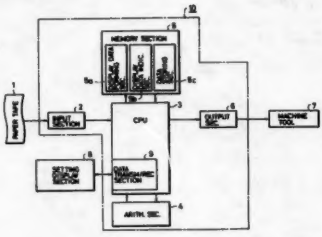
Continuation of Ser. No. 118,003, Oct. 29, 1987, abandoned, which is a division of Ser. No. 768,602, Aug. 23, 1985, Pat. No. 4,739,468. This application Apr. 19, 1989, Ser. No. 342,612
Claims priority, application Japan, Aug. 24, 1984, 59-175239
Int. Cl.[4] G06F *15/46;* G05B *19/18*
U.S. Cl. 364—474.23 3 Claims

1. A numerical control device for controlling operation of a machine tool, the device comprising:

general-purpose setting display means (8), including a display device, for displaying machining data of the machine tool on said display device in one of a group of forms including a first type of character form, a second type of character form, and a graphic form, which form of the machining data can be changed from any one in the group to any other in the group in accordance with a user's desires, said setting display means being further adapted for effecting internal data processing using a high level language; and

numerical control means (10), having a data transmitting and receiving section (9) serially interfaced with said general-purpose setting display means, for transmitting display data using said high level language, said numerical control means further comprising a CPU (3) for numerical control of the operation of the tool; and

memory means (5c) for temporarily storing said display data, wherein the machining data includes data for controlling the operation and data for monitoring the operation, the



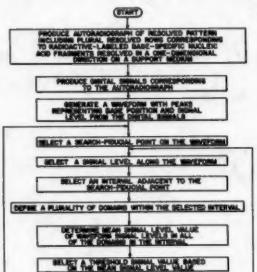
data for controlling the operation is unchanged by changes in form within the group, and wherein the first type of character form is a serial data form and the second type of character form is a data code form, whereby the type and format of the data displayed by said display device can be changed as desired by the user.

4,885,696

SIGNAL PROCESSING METHOD FOR DETERMINING BASE SEQUENCE OF NUCLEIC ACID

Makoto Hara, Minami-ashigari, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 25, 1987, Ser. No. 30,062
Claims priority, application Japan, Mar. 26, 1986, 61-69074; Feb. 4, 1987, 62-25010
Int. Cl.[4] G06F *15/46;* G01N *31/00*
U.S. Cl. 364—497 11 Claims


START
PRODUCE AUTORADIOGRAPH OF RESOLVED PATTERN INCLUDING PLURAL RESOLVED ROWS CONSISTING OF FOUR ROWS FORMED BY RESOLVING EACH OF FOUR GROUPS OF A MIXTURE OF BASE-SPECIFIC NUCLEIC ACID FRAGMENTS LABELED WITH A RADIOACTIVE ELEMENT MIGRATED IN A ONE-DIMENSIONAL DIRECTION ON A SUPPORT MEDIUM
PRODUCE DIGITAL SIGNALS CORRESPONDING TO THE AUTORADIOGRAPH
GENERATE A WAVEFORM WITH PEAKS REPRESENTING BASE POSITION AND SIGNAL LEVEL FROM THE DIGITAL SIGNALS
SELECT A SEARCH-FEGUCAL POINT ON THE WAVEFORM
SELECT A SIGNAL LEVEL ALONG THE WAVEFORM
SELECT AN INTERVAL ADJACENT TO THE SEARCH-FEGUCAL POINT
DEFINE A PLURALITY OF DOMAINS WITHIN THE SELECTED INTERVAL
DETERMINE MEAN SIGNAL LEVEL VALUE OF SIGNAL LEVELS IN ALL OF THE DOMAINS IN THE INTERVAL
SELECT A THRESHOLD SIGNAL VALUE BASED ON THE MEAN SIGNAL LEVEL VALUE
SEARCH THE INTERVAL FOR PEAKS WITH SIGNALS GREATER THAN THE THRESHOLD VALUE
IS PEAK LOCATED ?
NO
YES
IDENTIFY BAND CORRESPONDING TO NUCLEIC ACID BASE FROM PEAK
ARE ALL BANDS IDENTIFIED ?
NO
YES
SELECTED PEAK FOR NEXT SEARCH FEGUCAL POINT
END

1. A method for determining the base sequence of a nucleic acid by obtaining digital signals corresponding to an autoradiograph of a resolved pattern including plural resolved rows consisting of four rows formed by resolving each of four groups of a mixture of base-specific nucleic acid fragments on a support medium labeled with a radioactive element that have migrated in a one-dimensional migration direction on the support medium and processing the digital signals thus obtained to determine the nucleic acid base sequence, wherein the digital signal processing method includes the steps of:

(a) generating from said digital signals a waveform including

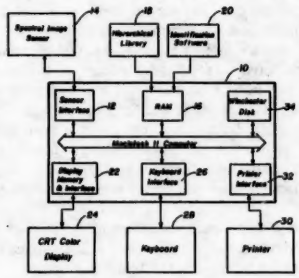
peaks representative of base position in the resolving direction and the signal level for each resolved row;
(b) selecting a search-fiducial point, an interval adjacent to said search-fiducial point, and a signal level on the waveform;
(c) defining a plurality of domains within said interval;
(d) first determining a mean signal level value of the waveform signal levels in said domains and then selecting a threshold signal value based on the mean signal signal level value;
(e) searching the interval to locate a peak having a signal level greater than the threshold signal value and, if a peak is located, identifying a band corresponding to a nucleic acid base at the position of the peak, wherein the located peak is then selected to be the next search-fiducial point and steps (b)–(e) are repeated to identify all of said bands on the resolved rows; or, if no peak is located, selecting a new search-fiducial point a predetermined distance from said original search-fiducial point; and
(f) determining the nucleic acid base sequence from the sequence of the bands identified in step (e).

4,885,697

METHOD OF IDENTIFYING SPECTRA

Romeo J. Hubner, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 1, 1988, Ser. No. 240,356
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—497 **20 Claims**



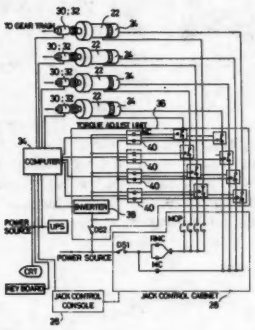
1. A method of establishing a hierarchial library of spectra, each spectrum corresponding to point-by-point representations of characteristics of a known sample, each spectrum being different from all other spectra, comprising the steps of:
(a) converting each spectrum into a vector in n-dimensional hyperspace corresponding to the point-by-point representations of a different known sample;
(b) determining mathematical angles, as determinitive of similarity, between all of the vectors;
(c) selecting a first vector which is closest to a mean of the vectors and hence represents a center of population of the vectors;
(d) selecting a second vector which is most dissimilar to the first vector and represents a local center of population;
(e) separating the vectors into first and second groups of vectors that are most similar to the selected first and second vectors;
(f) for each group of vectors, excluding each previously selected vector representing a center of population and selecting one new vector that represents a local center of population and another vector that is most dissimilar to the one vector and which represents a local center of population of vectors;
(g) separating the vectors of each group into pairs of subgroups according to their similarity to the centers of population vectors of step (f);
(h) associating the center of population vector for each group of vectors for each subgroup of vectors; and
(i) repeating steps (f), (g), and (h) for each successive subgroup until all vectors have been selected as centers of population.

4,885,698

OVERLOAD PREVENTION APPARATUS FOR JACKING SYSTEM OF OFFSHORE STRUCTURES

Josho Kawasaki, Tokyo, Japan, assignor to Mitsui Ocean Development & Engineering Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 872,283, Jun. 9, 1986, abandoned. This application Oct. 18, 1988, Ser. No. 259,286
Claims priority, application Japan, Jul. 28, 1985, 60-163899
Int. Cl.[4] G06F *15/20*; H02K *7/14*; E02B *17/08*
U.S. Cl. 364—506 **1 Claim**



1. A jacking system for an offshore structure having movable legs, the system comprising a plurality of elongated racks installed on each of the legs of the offshore structure, a plurality of pinions engaging with each said rack, an electric motor with a brake for independently driving each said pinion, and electric circuit means for controlling each said electric motor, said motor driving its associated pinion through reduction gearing,
an overload prevention apparatus comprising a torque meter and a tachometer associated with each of said pinions or its said motor;
a computer for receiving input information sensed by each said torque meter and each said tachometer;
a torque adjust unit having an inverter for supplying an output to each said motor to adjust the motor according to said input information and according to stored information in said computer; and
a pair of magnetic contactors and changeover switches for each of said motors with a brake, said magnetic contactors and changeover switches controlled by said computer being included in said electric circuit means.

4,885,699

DATA PROCESSING APPARATUS FOR EDITING, FILING, AND PRINTING IMAGE DATA BY MEANS OF VISUAL OBSERVATION OF THE DATA ON A DISPLAY SCREEN

Masami Taoda, and Hironobu Machida, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

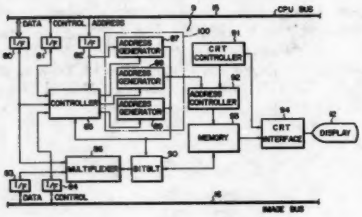
Filed Sep. 28, 1987, Ser. No. 101,981
Claims priority, application Japan, Dec. 26, 1986, 61-315386
Int. Cl.[4] G06F *11/10*
U.S. Cl. 364—518 **13 Claims**

1. A data processing apparatus comprising:
memory means for storing data, the memory means having a display memory means for storing at least one of image

data and character data to be displayed, and a font memory means for storing the character font data;

display means for displaying the data stored in said memory means; and

means for generating at least three addresses for addressing said memory means to execute simultaneously at least two



processings of first, second and third processings, the first processing for writing the image data into the memory means, the second processing for reading out the image data and character data from the display memory means, and the third processing for transferring the character font data from the font memory means to the display memory means.

4,885,700

COMPUTER-CONTROLLED METHOD AND APPARATUS FOR MAKING BINGO CARDS

Stanley Kondziolka, Markham, and Henry Klein, Thornhill, both of Canada, assignors to Demco Bingo Inc., Thornhill, Canada

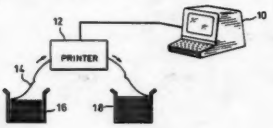
Continuation-in-part of Ser. No. 823,187, Jan. 27, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 165,183

Claims priority, application Canada, Oct. 24, 1985, 493719

The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.

Int. Cl.[4] G06F *15/44;* A63F *3/06*

U.S. Cl. 364—519 **7 Claims**



1. A method of making bingo cards, comprising the steps:

providing a computer having a memory, a random number generating capability and a comparator capability,

producing number combinations for a plurality of bingo cards on the basis of random numbers generated by the random number generating capability of the computer,

storing said number combinations in an electronic or magnetic memory,

employing the comparator capability of the computer to eliminate duplication from among said stored number combinations, and

using a computer-controlled, high-speed graphics printer to print, on sheets of paper, bingo cards having the said number combinations.

4,885,701

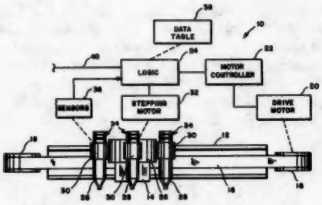
PEN TURRET CONTROL SYSTEM

Charles Gunderson, Buena Park, and Aftab H. Kapadya, Brea, both of Calif., assignors to CalComp Inc., Anaheim, Calif.

Continuation of Ser. No. 920,642, Oct. 20, 1986, which is a division of Ser. No. 633,170, Jul. 23, 1984, Pat. No. 4,677,572. This application Apr. 28, 1988, Ser. No. 191,789

Int. Cl.[4] G01D *15/28;* G05B *19/12*

U.S. Cl. 364—520 **4 Claims**



1. In a graphics plotter, including a turret for releasably holding a plurality of writing devices and a pen holder for exchangeably obtaining writing devices from the turret, in which the turret and holder are moved in combination on a pen carriage, the turret is rotated by a logic-controlled stepping motor, the pen holder is raised and lowered by a logic-controlled electromagnetic coil, and the pen carriage is moved by a logic-controlled drive motor, the improvement comprising:

(a) first sensor means for determining whether a turret is present on the pen carriage and for producing a signal indicating whether the turret is present on the pen carriage;

(b) second sensor means for determining whether the turret is in a home position and for producing a signal indicating whether the turret is in the home position;

(c) third sensor means for detecting the degree of proximity of the pen holder to raised and lowered positions and for producing a signal representative thereof;

(d) fourth sensor means for determining whether writing devices are present at addressable positions of the turret relative to said home position, for determining whether writing devices are present in the pen holder, for determining the type of writing device in the pen holder, and for producing signals representing the results of those determinations;

(e) at least one writing device held by the turret in at least one of the addressable positions thereof and providing a type-indicating indicium detectable by the fourth sensing means to indicate the type of said writing device;

(f) variable current source means connected to the electromagnetic coil for controlling the position of the pen holder and the downward pressure on a writing device in the holder; and

(g) logic circuitry, responsive to the signals produced by the first, second, third, and fourth sensor means, for logging, when the first sensor means indicates that the turret is present, the types of writing devices contained in the turret and their positions relative to the turret home position, and for operating the variable current source to control the position of the pen holder and its downward pressure in accordance with the logged writing-device type and the proximity, as indicated by the third sensor means, of the pen holder to its raised or lowered position.

4,885,702

METHOD OF FORMING CURVED SURFACES AND THE APPARATUS

Akio Ohba, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

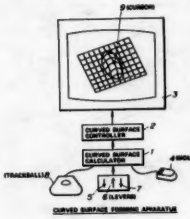
Continuation of Ser. No. 888,846, Jul. 22, 1986, Pat. No. 4,799,581. This application Nov. 9, 1988, Ser. No. 268,773

Claims priority, application Japan, Jul. 27, 1985, 60-166312; Oct. 24, 1985, 60-238166; Nov. 25, 1985, 60-266575

The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.

Int. Cl.[4] G06F *15/72*

U.S. Cl. 364—521 **5 Claims**



1. A method of interactively generating electronic data which is representative of a curved surface and visually displaying the surface to an operator, wherein the method comprises the following steps of:

(a) selectively generating data representative of a desired deformation area including an action point on a surface to be deformed;

(b) selectively determining a vector field function F_i representative of a relative deformation rate at each point within the deformation area;

(c) selectively designating a deformation vector V_i^* representative of a deformation quantity and a deformation direction at the action point within the deformation area;

(d) electronically calculating a position vector representative of a deformation quantity of a curved surface at each point within the deformation area on the basis of the deformation vector V_i^* and the vector field function F_i;

(e) electronically calculating a position vector P_i^* representative of a deformed curved surface on the basis of the position vector representative of the deformation quantity of the curved surface and a position vector P_{i-1}^* representative of the surface to be deformed; and

(f) visually displaying to an operator the deformed curved surface represented by the position vector P_i^* from a preselected point of view.

4,885,703

3-D GRAPHICS DISPLAY SYSTEM USING TRIANGLE PROCESSOR PIPELINE

Michael F. Deering, Mountain View, Calif., assignor to Schlumberger Systems, Inc., Sunnyvale, Calif.

Filed Nov. 4, 1987, Ser. No. 117,111

Int. Cl.[4] G06F *15/626*

U.S. Cl. 364—522 **14 Claims**

1. A graphics processing system, capable of being coupled to a monitor, for representing three-dimensional images on the monitor, comprising:

means for converting a representation of three-dimensional objects into a group of two-dimensional polygons;

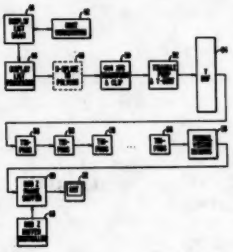
means for ordering said polygons by scan lines on said monitor on which said polygons will first appear;

a pipeline of polygon processors coupled in series to receive said polygons from said means for ordering at a first end of said series, each of said polygon processors including

means for storing a representation of a single, separate one of said polygons,

means for comparing said representation of one of said polygons to a pixel to determine whether said pixel is within said polygon,

means for comparing any Z position tagged to said pixel to the Z position of said polygon, at the x-y location of said



polygon corresponding to the x-y location of said pixel, if said pixel is within said polygon, and

means for tagging to said pixel a material property and Z position of said pixel in said polygon to a next polygon processor in said series if said polygon has a Z position in front of said Z position tagged to said pixel; and

means coupled to a second end of said series, for displaying said pixels on said monitor.

4,885,704

ELECTRONIC DOCUMENT FILING APPARATUS WITH ICON SELECTION

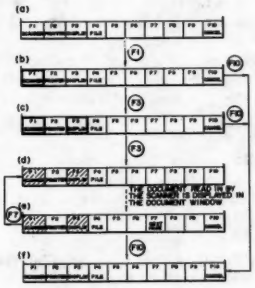
Shiro Takagi, Yokohama; Minoru Sato, Tokyo, and Koji Izawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 22, 1987, Ser. No. 99,902

Claims priority, application Japan, Jan. 12, 1987, 62-4741; Jan. 31, 1987, 62-21030

Int. Cl.[4] G09G *1/06*

U.S. Cl. 364—521 **24 Claims**



20. A data processing apparatus comprising:

means for displaying data, and a plurality of commands including an input command, a file command, and a display command;

means for sequentially, manually selecting at least two of the plurality of commands displayed on said display means;

means for inputting data in response to only the input command and at least one of the display command and the file command, which commands are sequentially selected by said selection means; and

means for storing the data input by said inputting means, in

response to only the input command followed by at least one of the file command and a command group sequentially including the display command and the file command; and

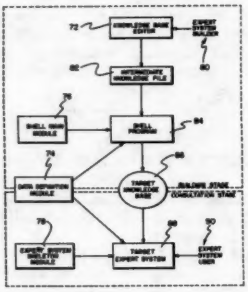
wherein said display means displays the data from one of said inputting means and said storing means, in response to one of the input commands, the file command, and the display command, which commands are sequentially selected by said selecting means.

4,885,705

EXPERT SYSTEM SHELL FOR BUILDING PHOTOFINISHING DIAGNOSTIC SYSTEMS

King F. Choi, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 25, 1988, Ser. No. 160,475
Int. Cl.[4] G06F *15/18*; G01J *29/00*
U.S. Cl. 364—525 4 Claims



1. A knowledge engineering tool for use by an expert system user in conjunction with a photofinishing process incorporating a control strip for providing diagnostic information concerning said process, said tool comprising:

(a) a target expert system;

(b) means for inputting into said target expert system target data obtained from analysis of said control strip used in said photofinishing process for allowing said target expert system to look for any deviations from the norm in said target data;

(c) a target knowledge base module;

(d) means for inputting into said target knowledge base module additional data relating to said photofinishing process;

(e) a data definition module;

(f) means for inputting into said data definition module structural knowledge relating to a photofinishing process;

(g) an expert system skeleton module that contains structural knowledge along with requested data from said target knowledge base module and structural knowledge existing within said data definition module to provide a list of symptoms characterizing said process to the expert system user;

(h) means for generating a first list of possible causes of any deviation from normal and an indication of the occurrance of said causes based upon the system characterization of this particular process; and

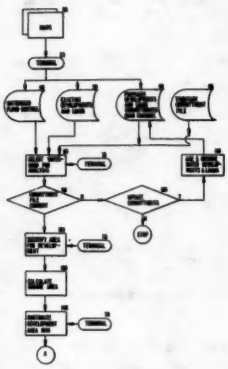
(i) means for generating a second list of prescriptions for alleviating each of the possible causes in said first list.

4,885,706

COMPUTER AIDED FLOOD CONTROL MODELING AND MANAGEMENT SYSTEM

Gerry E. Pate; Ronald L. Mullinax, both of Houston; Alexander G. Sutton, Kingwood, and Jeff E. Ross, Houston, all of Tex., assignors to Pate Systems, Inc., Houston, Tex.

Filed Feb. 3, 1988, Ser. No. 151,891
Int. Cl.[4] G06F *15/36, 15/56*
U.S. Cl. 364—551.01 15 Claims



1. A method for evaluating the effect of proposed developments or system modifications upon a flood control system, the steps of which comprise:

(a) establishing a system watershed data base including data representing a plurality of watersheds and associated parameters, said parameters including data relating to hydrological and hydraulic characteristics of primary and secondary water channels, location and surface acreage of existing developments, expected rainfall levels, and terrain data associated with said watersheds;

(b) identifying the watershed within which the proposed development or system modification is located;

(c) developing data representative of the boundaries of the proposed development or modification;

(d) calculating the hydrological parameters associated with the proposed land development or system modification within the selected watershed;

(e) reviewing a data file including data representative of the status of previously approved developments or modifications within the selected watershed to determine whether such previously approved developments or modifications are current;

(f) determining the hydrological parameters associated with the portion of the flood control system comprising the existing, currently approved and proposed land developments or modifications within the selected watershed;

(g) modifying the watershed data base to include data representative of the hydrological parameters of the proposed and previously approved and current new developments;

(h) determining modified hydrological flow rates for main and secondary channels within the selected watershed utilizing the modified watershed data base;

(i) determining modified flows for a plurality of stations or locations located along the main water channels within the selected watershed;

(j) establishing a modified hydraulic analysis input data base including data representative of the hydrological and hydraulic parameters of the portion of the flood control system comprising the existing watershed, the approved developments and the proposed development or modifications;

(k) determining the effects of the proposed development or modification upon the selected watershed and associated

flood control system utilizing the data within the modified hydraulic analysis input data file, including a determination of the water surface profile for stations or locations along the primary water channel within the selected watershed;

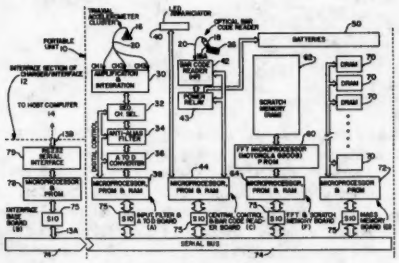
(l) comparing the effects of the proposed development or modification with prescribed minimum or maximum parameters to determine if the effects of the proposed development or modification cause the watershed parameters to satisfy the prescribed minimums or maximums.

4,885,707

VIBRATION DATA COLLECTING AND PROCESSING APPARATUS AND METHOD

Robert E. Nichol; Robert B. Grant, and Charles T. Faddis, all of Bainbridge Island, Wash., assignors to DLI Corporation, Bainbridge Island, Wash.

Filed Feb. 19, 1987, Ser. No. 16,272
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—551.01 **7 Claims**



1. A method of predictive maintenance of a plurality of machines by collecting and analyzing vibration data comprising the steps of:

providing at each of a plurality of stations of a plurality of machines a predetermined electro-optically readable code identifying the vibration data collection station thereon;

storing in an electronic memory contained within a portable vibration data collection and processing apparatus, addressable machine file data containing preprogrammed data collection and data processing parameters for each of the plurality of data collection stations;

collecting vibration data from each of said stations by temporarily attaching a vibration sensor to an indexing mount at the machine station, reading said code adjacent the data collection station, using said code to address the electronic memory for retrieving machine file data stored for each of such stations and receiving vibration signals from the vibration sensor, conditioning such signals by filtering and converting same in accordance with said predetermined data collection and data processing parameters, into discrete time domain digital data representing machine vibration as a function of time;

transforming said discrete time domain digital data representing machine vibration at each station into frequency domain digital data representing machine vibration in the frequency domain;

temporarily storing said discrete time domain digital data in a common battery powered random access memory with said frequency domain digital data using address areas in opposing storage regions of said common random access memory, and providing said common random access memory with a moving partition means for separating said discrete time domain digital data from said frequency domain digital data; and

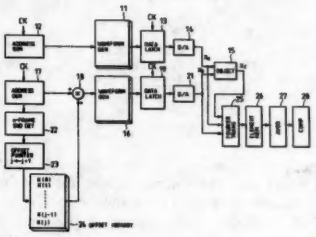
transferring the stored discrete time domain and/or frequency domain digital data to a host computer for predictive maintenance analysis of such data.

4,885,708

APPARATUS AND METHOD FOR MEASURING FREQUENCY RESPONSE FUNCTION

Takahiro Yamaguchi, Kumagaya; Toshiharu Kasahara, Okegawa, and Hiromi Kosawa, Gyoda, all of Japan, assignors to Advantest Corporation, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,879
Claims priority, application Japan, Nov. 20, 1987, 62-294318
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—553 **5 Claims**



1. A frequency response function measuring apparatus for connection to an object to be measured, comprising:

first address generating means for repeatedly generating a sequence of addresses in synchronism with a clock;

second address generating means for generating a sequence of addresses in synchronism with the clock, while arbitrarily shifting the sequence of addresses every fixed period;

first waveform generating means which has written therein a first multiple waveform containing desired analyzing frequency components and having opposite ends which are continuous to each other, the first multiple waveform being read out by the addresses generated by said first address generating means to generate a first analog excitation signal to be applied to the object to be measured;

second waveform generating means which has written therein a second multiple waveform containing desired analyzing frequency components and having opposite ends which are continuous to each other, the second multiple waveform being read out by the addresses generated by said second address generating means to generate a second analog excitation signal to be applied to the object to be measured.

Fourier transform means for extracting at least one frame of a predetermined numer of samples from each of the first and second analog excitation signals and a response signal from the object in a predetermined length of analysis every said fixed period, and for subjecting each frame of the extracted samples of the first and second excitation signals and the response signal to Fourier transform and then to calculation of elements of a cross spectral matrix every said fixed period;

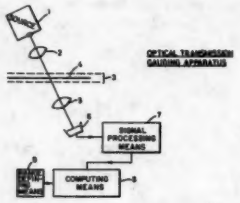
averaging means for sequentially averaging corresponding elements of the corresponding cross spectral matrices a predetermined number of times corresponding to the shifting of the sequence of addresses to obtain elements of an averaged cross spectral matrix; and

computing means for computing a desired frequency response function from selected elements of the averaged cross spectral matrix calculated by said averaging means.

4,885,709
METHOD AND APPARATUS FOR SENSING OR DETERMINING ONE OR MORE PROPERTIES OR THE IDENTITY OF A SAMPLE

Roger F. Edgar, Maldon, and Peter H. Hindle, Hatfield Peverel, both of England, assignors to Infrared Engineering Limited, Maldon, England

Filed Jan. 16, 1987, Ser. No. 4,347
Claims priority, application United Kingdom, Jan. 17, 1986, 8601176
Int. Cl.[4] G01N *23/16;* G01B *15/02*
U.S. Cl. 364—563 35 Claims



1. A method of sensing or determining a characteristic feature of a sample, the method comprising the steps of:

(a) selectively utilizing electromagnetic radiation whose optical character is changed by said sample due to an optical effect which is at least one of optical interference, absorption, or scatter;

(b) causing said electromagnetic radiation to be directed to said sample whereby the optical character of said radiation is changed as a result of the relevant transmission or reflection by said sample, the selection of said radiation being such as to include at least three discrete components selected from a spectral range so that at least one of said components is subjected to said optical effect so that said optical character is changed;

(c) measuring the relevant transmittance or reflectance of said sample for each of said components to derive respective measured values;

(d) correlating said measured values with different known values of relevant transmittance or reflectance, said different known values representing different values of known characteristic features of a known material or materials; and

(e) selecting the known values having an optimum correlation with said measured values, the selected known values representing the characteristic feature of the sample which is sensed or to be determined.

22. Apparatus for sensing or determining a characteristic feature of a sample utilizing electromagnetic radiation selected to be subject to an optical effect which is at least one of optical interference, absorption, or scatter, the apparatus comprising:

(a) means for causing said electromagnetic radiation to be directed to said sample, said radiation including at least three discrete components selected from a spectral range so that at least one of said components is subjected to said optical effect so that the optical character of said component is changed;

(b) means for receiving the relevant transmitted or reflected radiation components and for providing corresponding measurement values;

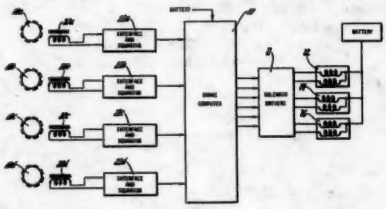
(c) means for providing different known values of relevant transmittance or reflectance, said different known values representing different values of known characteristic features of a known material;

(d) means for determining the correlation between said measured values and said known values and for selecting the known values having an optimum correlation with said measured values, the selected known values representing the characteristic feature of the sample which is sensed or to be determined.

4,885,710
METHOD AND APPARATUS FOR LOW SPEED ESTIMATION

Jill G. Hersberger, Galveston; Myron H. Bell, Indianapolis; Robert L. Harding, and Peter J. Spadafora, both of Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Continuation of Ser. No. 66,317, Jun. 25, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 323,036
Int. Cl.[4] G01P *3/36*
U.S. Cl. 364—565 4 Claims



1. A system for use with a rotating member having a rotational speed, the system comprising, in combination:

a speed sensor for generating a speed signal for each predetermined angular rotation of the rotating member, the generated speed signals having a time interval between speed signals that is a measure of the rotation speed and

means for (A) establishing successive sampling intervals, (B) measuring the rotational speed of the member following each sampling interval during which one or more speed signals are generated by determining an average time between speed signals generated in a calculation interval ending at the last speed signal generated in the sampling interval during which one or more speed signals were generated, the average time being a measurement of the rotational speed of the rotating member and (C) estimating the rotational speed of the member following each sampling interval during which no speed signals were generated by measuring a time interval extending from the last speed signal generated during a prior sampling interval to the end of the sampling interval during which no speed signals were generated, the measured time interval comprising an estimated time interval between speed signals and therefore an estimated of the rotational speed of the rotating member.

4,885,711
DATA PROCESSING

Dennis B. Neff, c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Continuation of Ser. No. 589,446, Mar. 14, 1984, abandoned. This application Sep. 8, 1987, Ser. No. 94,238
Int. Cl.[4] G06G *7/12;* H03F *1/26;* G01V *1/00*
U.S. Cl. 364—574 17 Claims

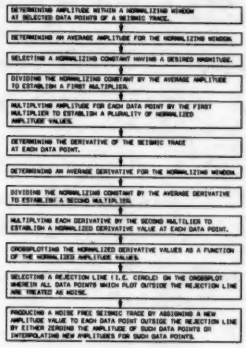
6. A method for removing noise from seismic data, wherein the seismic data comprises at least one seismic trace generated by at least one geophone in response to seismic waves imparted into the earth, said method comprising the steps of:

(a) selecting a plurality of data points for said seismic trace;

(b) selecting a normalizing window having a desired time length, wherein said normalizing window contains at least a portion of said plurality of data points;

(c) determining the amplitude of said seismic trace at all data points contained in said normalizing window;

(d) determining the average of the amplitudes determined in step (c) to establish an average amplitude;
(e) selecting a normalizing constant having a desired magnitude;
(f) dividing said normalizing constant by said average amplitude to establish a first multiplier;
(g) multiplying the amplitude of said seismic trace at each of the plurality of data points contained in said normalizing window by said first multiplier to establish a plurality of normalized amplitude values for the seismic trace at each of the data points contained in said normalizing window;
(h) determining the derivative of said seismic trace at each of the plurality of data points contained in said normalizing window;
(i) determining the average of the derivatives determined in step (h) to establish an average derivative for said normalizing window;


DETERMINING AMPLITUDE WITHIN A NORMALIZING WINDOW AT SELECTED DATA POINTS OF A SEISMIC TRACE.
DETERMINING AN AVERAGE AMPLITUDE FOR THE NORMALIZING WINDOW.
SELECTING A NORMALIZING CONSTANT HAVING A DESIRED MAGNITUDE.
DIVIDING THE NORMALIZING CONSTANT BY THE AVERAGE AMPLITUDE TO ESTABLISH A FIRST MULTIPLIER.
MULTIPLYING AMPLITUDE FOR EACH DATA POINT BY THE FIRST MULTIPLIER TO ESTABLISH A PLURALITY OF NORMALIZED AMPLITUDE VALUES.
DETERMINING THE DERIVATIVE OF THE SEISMIC TRACE AT EACH DATA POINT.
DETERMINING AN AVERAGE DERIVATIVE FOR THE NORMALIZING WINDOW.
DIVIDING THE NORMALIZING CONSTANT BY THE AVERAGE DERIVATIVE TO ESTABLISH A SECOND MULTIPLIER.
MULTIPLYING EACH DERIVATIVE BY THE SECOND MULTILIER TO ESTABLISH A NORMALIZED DERIVATIVE VALUE AT EACH DATA POINT.
CROSSPLOTTING THE NORMALIZED DERIVATIVE VALUES AS A FUNCTION OF THE NORMALIZED AMPLITUDE VALUES.
SELECTING A REJECTION LINE I.E. CIRCLE ON THE CROSSPLOT WHEREIN ALL DATA POINTS WHICH PLOT OUTSIDE THE REJECTION LINE ARE TREATED AS NOISE.
PRODUCING A NOISE FREE SEISMIC TRACE BY ASSIGNING A NEW AMPLITUDE VALUE TO EACH DATA POINT OUTSIDE THE REJECTION LINE BY EITHER ZEROING THE AMPLITUDE OF SUCH DATA POINTS OR INTERPOLATING NEW AMPLITUDES FOR SUCH DATA POINTS.

(j) dividing said normalizing constant by said average derivative for said normalizing window to establish a second multiplier;
(k) multiplying each derivative determined in step (h) by said second multiplier to establish a normalized derivative value for the seismic trace at each data point contained in said normalizing window;
(l) crossplotting the normalized derivative values determined in step (k) as a function of the normalized amplitude values determined in step (g);
(m) selecting a rejection line on the crossplot of step (l), wherein all data points which plot outside of said rejection line are treated as noise; and
(n) producing a substantially noise free seismic trace by assigning a new amplitude value to each data point which plots outside of said rejection line to thereby remove noise at said data point from said seismic trace.

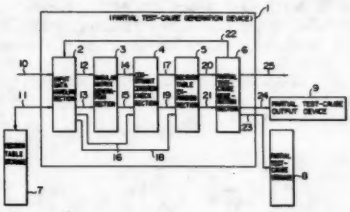
4,885,712

METHOD AND APPARATUS FOR PARTIAL TEST-CAUSE GENERATION

Yasuaki Yamane, Ebina, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 13, 1987, Ser. No. 85,083
Claims priority, application Japan, Sep. 9, 1986, 61-212489
Int. Cl.[4] G06F *11/00, 11/22*
U.S. Cl. 364—580 **4 Claims**

3. A partial test-cause generation apparatus comprising:
first means for entering data structure of a boolean function expressed in a decision table, the decision table being indicative of output conditions and the states after transition, for combinations of various input conditions;
second means for generating a singular matrix based on the entered data structure;
third means for checking constraint conditions by comparison of the entered data structure and the generated singular matrix to produce a cause pattern row;
fourth means for expanding the cause pattern row produced by said third means into effect and state pattern rows; and



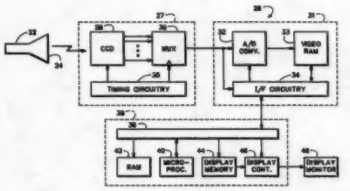
fifth means for checking the validity of said cause, effect and state pattern rows, and editing the resulting pattern rows to produce a partial test-cause.

4,885,713

SYSTEM FOR DIGITIZING THE TRAJECTORY OF A TARGET POINT OF A MOVING BEAM

Norbert Miller, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 22, 1987, Ser. No. 41,381
Int. Cl.[4] G06J *1/00*; G06F *3/153*
U.S. Cl. 364—604 **9 Claims**



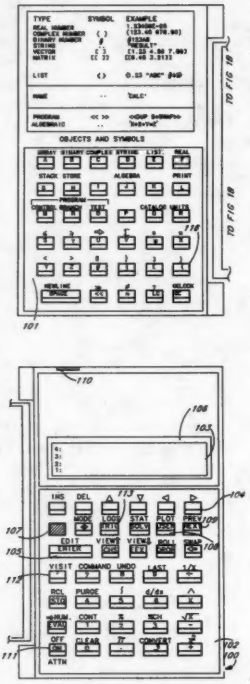
1. A method for digitizing the trajectory of a target point of a moving beam directed toward a surface comprising the steps of:
determining a particular point along each of a plurality of parallel axes of the surface for which a two-dimensional convolution integral with respect to said particular point of two functions is a maximum, a first of the two functions comprising an instantaneous intensity distribution of the beam on the surface with respect to the position of the target point on the surface, and a second of the two functions comprising the average beam intensity distribution on the surface produced as the target point of the beam moves across the surface during a finite period; and
generating a digital data sequence in which each data element thereof represents the position on the surface of a separate one of the particular points.

4,885,714

CALCULATOR HAVING A USER-ACCESSIBLE OBJECT STACK FOR THE UNIFORM APPLICATION OF MATHEMATICAL FUNCTIONS AND LOGICAL OPERATIONS TO A MULTIPLICITY OF OBJECT TYPES

Gabe L. Eisenstein, Corvallis; Laurence W. Grodd, Portland; Paul J. McClellan; Robert M. Miller, both of Corvallis; Charles M. Patton, Eugene, and William C. Wickes, Corvallis, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 27, 1986, Ser. No. 923,933
Int. Cl.[4] G06F *15/00*
U.S. Cl. 364—709.01 7 Claims



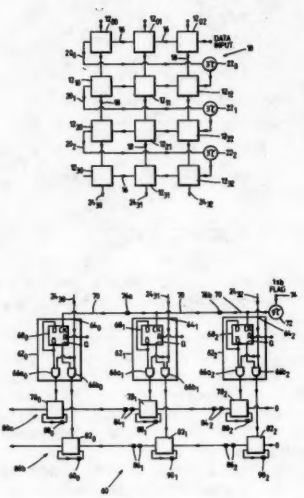
1. An electronic calculator, comprising:
a. memory means including a data stack;
b. a display;
c. objects in said memory means, each object having an object type identifier, each object having a logical syntax;
d. individual programs of object execution concordant with the syntax of individual objects, in said memory means, each program having an identifier of its program of object execution;
e. a user interface for accessing said memory means;
f. first means forming part of said user interface for selecting and displaying a plurality of user readable identifiers of programs of object execution from said memory means, which programs of object execution are concordant with the syntax of a user selected class of object types;
g. second means forming part of said user interface for selecting and displaying a user readable identifier of a single program of object execution from said plurality of programs of object execution, which single program of object execution is concordant with a selected object;
h. third means forming part of said user interface for accessing said memory means for selecting and displaying said selected object type in user readable form; and
i. fourth means forming part of said user interface for entering said selected object for processing on said data stack and shifting each selected object on said display to indicate to a userr that each selected object has been entered on the data stack.

4,885,715

DIGITAL PROCESSOR FOR CONVOLUTION AND CORRELATION

John V. McCanny, County Down, Ireland; Richard A. Evans, Herefordshire, and John G. McWhirter, Worcestershire, both of Great Britain, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 5, 1987, Ser. No. 21,939
Claims priority, application United Kingdom, Mar. 5, 1986, 8605366
Int. Cl.[4] G06F *15/336*
U.S. Cl. 364—728.01 8 Claims



1. A digital processor suitable for performing an N point convolution or correlation computation of coefficient words of q bits with data words guard band extended to p bits, where N, q and p are positive integers greater than unity, and wherein:
(1) the processor includes an array of N rows and q columns of one-bit logic cells;
(2) each logic cell is arranged to:
(a) input a data bit, a carry bit and a cumulative sum bit,
(b) output said data bit,
(c) produce an output cumulative sum bit and an output carry corresponding to addition of the input cumulative sum bit and the input carry bit to a product of the input data bit with a respective stationary coefficient bit, and
(d) recirculate the output carry bit on the respective cell to provide an input carry bit for a succeeding computation;
(3) cell interconnection lines are arranged to provide for propagation of data bits along array rows and for accumulation of cumulative sum bits in cascade down array columns;
(4) the cell interconnection lines include clock-activated first

delaying means arranged to effect data bit movement along array rows at the same rate as cumulative sum bit movement down array columns;

(5) the array has a first row, first column cell for data word input to the array serially, least significant bit leading;

(6) each last column cell in the first to (N−1)th rows has a respective data bit output connected via a respective second clock-activated delaying means to a data bit input of a respective first column cell in a respective adjacent row from the second to Nth rows to provide for data to move along successive rows down the array, the first and second delaying means being arranged in combination to delay successive data bits as appropriate for accumulation of cumulative sum bits in cascade down each array column; and

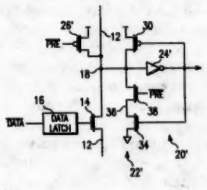
(7) the processor includes accumulating means arranged to add cumulative sum bits of the like bit significance output from different array columns and comprising contributions to like computation term bits.

4,885,716

HIGH SPEED CARRY CHAIN

Wendell L. Little, Carrollton, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Filed Aug. 15, 1988, Ser. No. 232,403
Int. Cl.[4] G06F 7/50
U.S. Cl. 364—786 **29 Claims**



1. A digital arithmetic circuit, comprising:

a plurality of arithmetic logic circuit blocks connected, substantially in parallel, to each perform a predetermined operation on respective bits of one or more operands and to each provide a respective preliminary result bit accordingly; and

a plurality of carry chain stages connected in series along a carry line, wherein ones of said stages are each connected to receive said preliminary result bit from a respective one of said arithmetic logic blocks, and each include:

a precharge device, connected to precharge said carry line to a first voltage;

a pass transistor, connected to selectably connect or disconnect said carry line through said stage; and

a carry latch, having an input connected to said carry line, wherein said carry latch is connected to be at least partially disabled whenever said precharge device is turned on; and

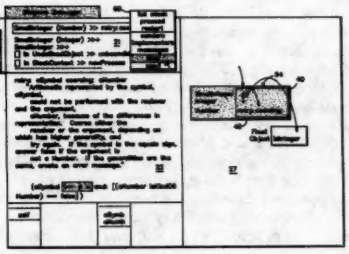
a plurality of data output logic stages, each connected to combine an output of a respective one of said carry latches with said respective preliminary result bit of a corresponding one of said arithmetic logic circuit blocks.

4,885,717

SYSTEM FOR GRAPHICALLY REPRESENTING OPERATION OF OBJECT-ORIENTED PROGRAMS

Kent L. Beck, Aloha, and Howard G. Cunningham, Jr., Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Ohio

Filed Sep. 25, 1986, Ser. No. 912,025
Int. Cl.[4] G06F 11/30
U.S. Cl. 364—900 **17 Claims**



1. An object oriented program employing

a plurality of transmitting objects,

a plurality of receiving objects,

a plurality of messages, wherein said plurality of messages are transmitted to said plurality of receiving objects by said transmitting objects, and

an existing debugger routine, wherein said existing debugger routine can suspend operation of said program;

a diagramming debugger process comprising the steps of:

recording transmission of said plurality of messages from said plurality of transmitting objects as the program is running wherein said recording includes examining a next program instruction, recording names of transmitting objects, recording messages sent, recording names of receiving objects, and allowing the existing debugger operation to take place;

graphically representing the recorded transmission,

wherein said graphic representation includes:

a first plurality of area-limited representations of said transmitting objects;

a second plurality of area-limited representations of receiving objects; and

a third plurality of area-limited representations of said messages.

4,885,718

EXTENDED COMMUNICATIONS LINK FOR KEYBOARD AND DISPLAY UNITS REMOTELY LOCATED FROM A COMPUTER

Robert R. Asprey, Harvest, and Remigius G. Shatas, Huntsville, both of Ala., assignors to Cybex Corporation, Huntsville, Ala.

Filed Sep. 11, 1987, Ser. No. 95,140
Int. Cl.[4] G06F 3/00, 3/02, 3/153; H04L 25/00
U.S. Cl. 364—900 **2 Claims**

1. A communications link extending up to 150 feet for coupling the keyboard and monitor connections of a digital computer to a keyboard and monochrome monitor, comprising:

a first signal conditioning assembly positionable generally proximate to a digital computer, comprising:

a first housing,

first cable receptacle terminals supported by said housing and disposed for electrically coupled engagement with a computer-keyboard cable, said first cable receptacle terminals comprising clock, data, positive bias voltage, logic ground, and chassis ground terminals,

second cable receptacle terminals supported by said first

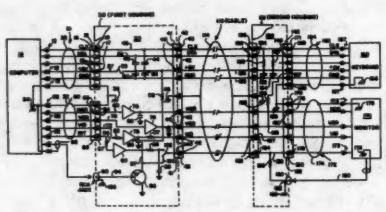
housing and disposed for electrically coupled engagement with a computer-monitor cable, comprising horizontal sync, vertical sync, video, intensity, and chassis ground terminals,

third cable receptacle terminals supported by said first housing and comprising clock, data, positive bias voltage, logic ground, horizontal sync, vertical sync, video, video related signal, and chassis ground terminals, and said clock, data, positive bias voltage, logic ground, and chassis ground terminals, and said last-named clock, data, positive bias voltage, logic ground terminals being connected to like designated receptacle terminals of said first and second receptacle terminals, and

a first capacitor within said first housing having capacitance of approximately 0.002 mf connected between said clock terminal and positive bias voltage terminal, and a second capacitor within said housing having a capacitance of approximately 0.006 mf connected between said data terminal and a said positive bias voltage terminal;

a relatively large capacitor and a relatively small capacitor within said first housing, both being connected between a said positive bias voltage terminal and logic ground terminal, wherein said relatively large capacitor has capacitance on the order of 22 mf, and said relatively small capacitor has a capacitance on the order of 0.1 mf;

a first logic amplifier being connected in circuit between said horizontal sync terminals and a second logic amplifier being connected in circuit between said vertical sync terminals;



a resistor and third logic amplifier serially in circuit in the named order from said video terminal of said second cable receptacle terminals and said video terminal of said third cable receptacle terminals;

a resistor and fourth logic amplifier serially in circuit in the last-named order between said intensity terminal of said second cable receptacle terminals and said video related terminal of said third cable receptacle terminals;

an elongated cable having a first set of terminals at one end disposed for electrically coupled engagement with said third cable receptacle terminals and having at an opposite end an interconnected set of like identified terminals; and

a second signal conditioning assembly comprising:

a second housing,

fourth cable receptacle terminals supported by said second housing and having clock, data, positive bias voltage, logic ground, vertical sync, horizontal sync, video, and video related cable receptacle terminals adapted to receive the opposite end terminals of said elongated cable,

fifth cable receptacle terminals, keyboard terminals, supported by said second housing and having clock, data, positive bias voltage, logic ground, and chassis ground terminals connected to like designated terminals of said fourth cable receptacle terminals,

sixth cable receptacle terminals, monitor terminals, having vertical sync, horizontal sync, video, video related, and chassis ground terminals connected to like designated terminals of said fourth cable receptacle terminals,

a first resistor connected between said clock terminal and positive bias voltage terminal, and a second resistor connected between said data terminal and said positive bias voltage terminal, wherein each of said first and second resistors having a value of approximately 1,000 ohms,

a relatively large capacitor and a relatively small capacitor connected between said positive bias voltage terminal and logic ground terminal of said second signal conditioning assembly, wherein said relatively large capacitor has capacitance on the order of 22 mf, and said relatively small capacitor has a capacitance on the order of 0.1 mf, and

a third resistor having a resistance value of approximately 150 ohms connected between said vertical sync and logic ground terminals.

4,885,719

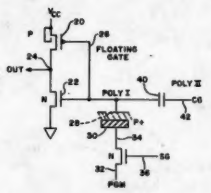
IMPROVED LOGIC CELL ARRAY USING CMOS E^2 PROM CELLS

Dhaval J. Brahmbhatt, San Jose, Calif., assignor to ICT International CMOS Technology, Inc., San Jose, Calif.

Filed Aug. 19, 1987, Ser. No. 87,143

Int. Cl.[4] G11C *11/40*; H03K *19/094*; H04Q *00/00*

U.S. Cl. 365—181 **4 Claims**



1. A logic cell array comprising a plurality of configurable logic blocks arranged in rows and columns, each logic block including an electrically erasable programmable memory cell (E^2PROM), said cell having a series connected CMOS transistor pair including a p-channel transistor having a source terminal connected to a positive voltage source and an n-channel transistor having a drain terminal connected a circuit ground potential, an output connected to a common terminal of said CMOS transistor pair, said CMOS transistor pair having a common floating gate, and means for selectively charging said common floating gate including capacitive means coupled to said floating gate, a programming electrode, a tunnelling oxide separating said programming electrode and said floating gate, and a programming transistor connected to said programming electrode for applying a programming voltage to said programming electrode for cold electron injection through said tunnelling oxide to said common floating gate.

4,885,720

MEMORY DEVICE AND METHOD IMPLEMENTING WORDLINE REDUNDANCY WITHOUT AN ACCESS TIME PENALTY

Christopher P. Miller, Jericho, and Charles S. Patton, Shelburne, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1988, Ser. No. 176,473

Int. Cl.[4] G11C *29/00*

U.S. Cl. 365—200 **17 Claims**

1. A semiconductor memory device comprising:

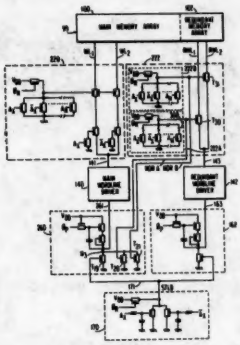
main wordline driver means for producing a main driver signal to be applied to a main wordline in a main memory array;

redundant wordline driver means for producing a redundant driver signal to be applied to a redundant wordline in a redundant memory array;

redundant word decoder means, associated with at least one redundant wordline, for comparing an input address signal

with defective main memory wordline addresses and, in response to the comparison, producing at least one comparison signal to control the propagation of said redundant driver signal along said at least one redundant wordline; and

main trigger means receiving said at least one comparison signal and, in response thereto, controlling a triggering of



said main wordline driver means to produce said main driver signal;

wherein said main trigger means and said redundant word decoder means are responsive to opposite states of said at least one comparison signal, such that, for a given comparison signal, only one of said main driver signal and redundant driver signal is allowed to propagate to said main and redundant memory array.

4,885,721

SEMICONDUCTOR MEMORY DEVICE WITH REDUNDANT MEMORY CELLS

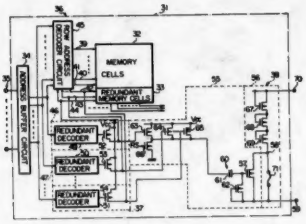
Naoki Katanosaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,452

Claims priority, application Japan, Sep. 10, 1987, 62-227612

Int. Cl.[4] G11C *7/00*

U.S. Cl. 371—10.2 **10 Claims**



1. A semiconductor memory device fabricated on a semiconductor chip, comprising:

(a) a purality of memory cells arranged in rows and columns, said memory cells in the respective rows being coupled to a plurality of word lines, respectively, each of said memory cells having a possibility of a defective memory cell;

(b) a plurality of redundant memory cells arranged in rows, said redundant memory cells in the respective rows being coupled to a plurality of redundant word lines, respectively;

(c) address means for receiving address signals including a row address signal representative of a row address;

(d) redundant decoder means having a plurality of redundant decoder units equal in number to the rows of said redundant memory cells, each of said redundant decoder units being capable of memorizing a row address assigned to said defective memory cell, each of said redundant decoder units being operative to produce a replacing signal for activating one of said redundant word lines when the row address memorized therein is identical with the row address represented by said row address signal;

(e) address decoding means having a row address decoder circuit, said row address decoder circuit being operative to activaate one of said word lines corresponding to the row address represented by said row address signal in the absence of said replacing signal, said row address decoder circuit being shifted into an inactive state in the presence of said replacing signal; and

(f) redundant state detection means having an address detecting section operative to produce a first detecting signal when the row address represented by said row address signal is identical with the row address memorized in one of said redundant decoder units, wherein said address detecting section comprises a single bypassing transistor coupled between a first node applied with a first voltage level and a second node, a single bootstrapping circuit operative to supply a gate electrode of said bypassing transistor with a second voltage level higher than said first voltage level by a value larger than a threshold voltage of said bypassing transistor, and a plurality of activaating transistors coupled in parallel between a source of a third voltage level and said bootstrapping circuit and having respective gate electrodes respectively supplied with replacing signals produced by said redundant decoder units, respectively, said second node being supplied with a voltage level lower than said first voltage level.

4,885,722

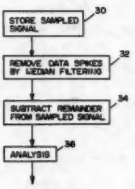
METHOD FOR REMOVING LOW-FREQUENCY NOISE FROM RECORDS WITH DATA IMPULSE

Frank Leland, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 19, 1988, Ser. No. 145,014

Int. Cl.[4] G01V *1/40*

U.S. Cl. 367—25 **4 Claims**



1. Method for separating high frequency impulse data of known generally periodic character in a signal recorded in a borehole logging operation from low frequency noise superimposed thereon, comprising the steps of:

storing the recorded signal;

applying median filtering to said stored signal, such that the impulses are removed from the median-filtered signal, said step of applying median filtering to the stored signal comprising the further steps of:

sampling the signal at regular intervals of time;

defining the length of a data window consisting of a predetermined number of samples of said signal, said number being predetermined in accordance with the known generally periodic character of the signal, such that no one data window includes more than one impulse;

successively ordering samples of said signal in said windows by amplitude; and

employing the median-valued sample in each window as

the corresponding value of the median-filtered signal; and

subtracting the median-filtered signal from the stored signal.

4,885,723

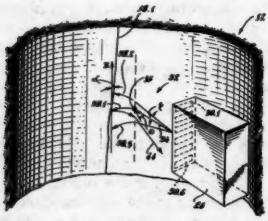
ACOUSTIC APPARATUS AND METHOD FOR DETECTING BOREHOLE WALL DISCONTINUITIES SUCH AS VERTICAL FRACTURES

R. Mark Havira, New Fairfield, Conn., and Bronislaw Seeman, Meudon, France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 18, 1981, Ser. No. 332,120

Int. Cl.[4] G01V *1/40*

U.S. Cl. 367—35 **19 Claims**



7. An acoustic investigation method for detecting discontinuities in a wall of a borehole penetrating an earth formation comprising the steps of:

directing from inside the borehole pulses of acoustic energy each at beam forming frequencies towards the borehole wall with orientations of the beams selected to preferentially enhance the excitation of transverse acoustic waves traveling away from the borehole wall segments in directions determined by the angle of incidence of the acoustic beams upon the borehole wall segment,

while substantially maintaining said beam orientations, varying the direction which said acoustic beams are incident upon said borehole wall segments to correspondingly vary the directions which said transverse waves travel from said borehole wall segments;

detecting acoustic reflections produced by said transverse waves when these are incident upon a discontinuity in the borehole wall;

deriving fracture signals representative of the presence of a said discontinuity from said detected acoustic reflections; and

recording said derived signals.

4,885,724

CABLELESS SEISMIC DIGITAL FIELD RECORDER HAVING ON-SITE SEISMIC DATA PROCESSING CAPABILITIES

Randol R. Read, Tulsa, Okla.; Ralph E. Warmack, Kingwood; James M. Farmer, Austin, both of Tex.; Jerry D. Henshaw, Tulsa, and Connie T. Marshall, Muskogee, both of Okla., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 836,028, Mar. 4, 1986, abandoned, which is a continuation of Ser. No. 454,405, Dec. 29, 1982, abandoned. This application Jun. 23, 1988, Ser. No. 212,157

Int. Cl.[4] G01V *1/16*; H04B *17/00*

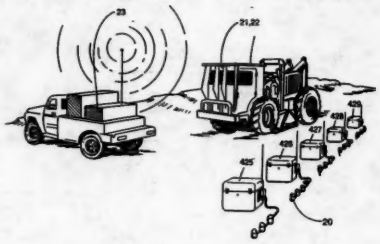
U.S. Cl. 367—77 **11 Claims**

1. A portable seismometer group recorder for use in seismic prospecting for processing seismic-trace signals from at least one seismic wave detector comprising:

(a) memory means in the recorder for storing a plurality of processing instructions for processing the seismic-trace signals, wherein the processing instructions include:

(i) instructions for weighting seismic-trace signals obtained from a plurality of initiations of a seismic source with inverse power weighting exponents selected from the group including 0, 1, 2, and 4; and

(ii) instructions for stacking weighted seismic-trace signals;



(b) means in the recorder responsive to transmitted coded signals for selecting processing instructions from the plurality of processing instructions stored in the memory means; and

(c) means in the recorder for processing the seismic-trace signals from at least one seismic wave detector in accordance with the selected processing instructions.

4,885,725

POSITION MEASURING APPARATUS AND METHOD

Brian D. McCarthy, and Bernard J. Regan, both of Surrey, England, assignors to MS Instruments public limited company, England

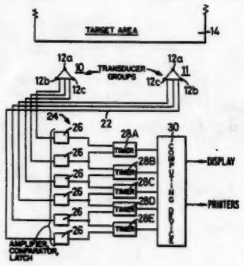
PCT No. PCT/GB87/00169, § 371 Date Nov. 12, 1987, § 102(e) Date Nov. 12, 1987, PCT Pub. No. WO87/05706, PCT Pub. Date Sep. 25, 1987

PCT Filed Mar. 12, 1987, Ser. No. 124,935

Claims priority, application United Kingdom, Mar. 12, 1986, 8606100

Int. Cl.[4] G01S *5/18*

U.S. Cl. 367—129 **11 Claims**



1. Apparatus for determining the position within a target area of the trajectory of a projectile travelling at a supersonic velocity to said target area, said apparatus comprising:

a plurality of transducers, said transducers being so arranged and disposed that they form two spaced-apart triangular groups which are associated with the plane of the target area through which the projectile passes,

each transducer being arranged to convert the mechanical impulse of a shock wave from the projectile into an electrical signal, and

processing means connected to receive said electrical signals and arranged to compute from said signals the direction of

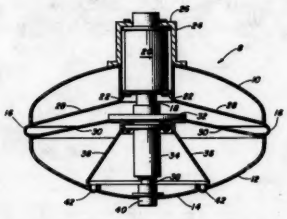
the projectile from each group of sensors, and to compute the position of the trajectory of said projectile within said target area in a coordinate system from said computed directions.

4,885,726

COMPOUND HYDRAULIC SEISMIC SOURCE VIBRATOR

Wilbur J. Myers, Ft. Worth, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 31, 1988, Ser. No. 265,428
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—142 **22 Claims**



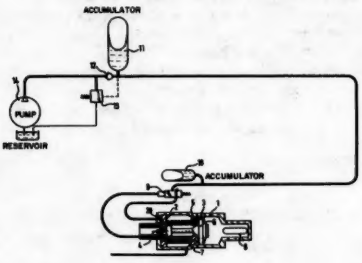
3. A compound seismic source vibrator comprising:
- a housing having an upper section and a low frequency radiating section;
- a low frequency means for vibrating said low frequency radiating section;
- a high frequency radiating section flexibly connected to said low frequency radiating section; and
- a high frequency means rigidly secured to said low frequency radiating section for separately vibrating said high frequency radiating section.

4,885,727

AUTOMATIC RESETTING OF SEISMIC WATER SOUND SOURCE

David Auger, Hayes, and Jacobus Breugelmans, Biggin Hill, both of England, assignors to Seismograph Service (England) Limited, Great Britain

Continuation of Ser. No. 691,495, Jan. 14, 1985, abandoned. This application Apr. 8, 1987, Ser. No. 36,198
Claims priority, application United Kingdom, Jan. 17, 1984, 8401171; Aug. 17, 1984, 8420907
Int. Cl.[4] G01V *1/14, 1/38*
U.S. Cl. 367—146 **13 Claims**



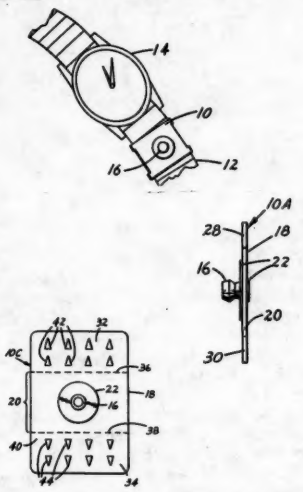
1. A seismic water gun, including an automatic resetting apparatus, which apparatus includes a source of pressurized resetting liquid, conduit means for connecting said source of pressurized resetting liquid to a sound-source, a sound-source including means for expelling a slug of water to generate an impulse of sound in the water, a main valve in said conduit means, means for operating the main valve controllable by and acted upon by the pressure of a sound-source charging fluid, said operator means being actuable at a predetermined value of pressure within said charging fluid less than that of said resetting liquid to move a valve member from a first position to a second position and which valve member remains in said second position until the pressure within the charging fluid falls below said predetermined value, whereupon said valve member moves from said second position to return to said first position, said valve member including a first passage aligned when in said second position to allow said resetting liquid to pass along said conduit means to reset said sound-source, and said valve member including a second passage aligned when in said first position to allow a discharge of the resetting liquid from the sound-source after said sound-source as been reset.

4,885,728

ELECTRICAL WRIST BAND CONNECTOR FOR A WATCH BAND

Jerome T. Gosselin, Round Rock, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 11, 1987, Ser. No. 61,911
Int. Cl.[4] H05F *3/00*
U.S. Cl. 368—10 **4 Claims**

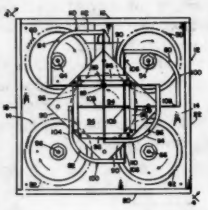


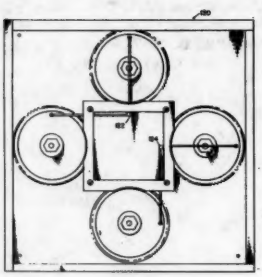
1. A wrist band connector affording electrical connection between a conductive wrist band and an electrical ground cable, said connector comprising:
- a sheet of deformable conductive metal having opposite surfaces and a central portion defined by sides and ends and integrally formed tabs positioned one on each side of said central portion, which tabs are foldable about the edges of a said wrist band for retaining said central portion on one surface of the band and for making electrical contact with the band, and
- a snap electrical connector mounted on one surface of said sheet and means for mechanically and electrically mounting said connector to said central portion of said sheet between said sides and ends for providing an electrical connection for a said cable to said sheet.

4,885,729
CLOCK MECHANISM AND DISPLAY FACE

Stephen M. Lee, 2024 Franklin Ave., E., Apt. 3F, Seattle, Wash. 98102

Filed Aug. 4, 1988, Ser. No. 228,532
Int. Cl.[4] G04B *19/04*
U.S. Cl. 368—76 20 Claims





1. A clock, comprising:

(a) a support frame,

(b) an electrical drive motor mounted on said frame with two coaxial shaft means including a first shaft on which is mounted a first drive gear for rotating at a first predetermined rotational speed and a second shaft on which is mounted a second drive gear axially spaced from said first drive gear for rotating at a second predetermined rotational speed,

(c) a pair of first driven gears engaging said first drive gear and each having a first upstanding display hand support post thereon, said support posts pivotally supporting thereon first hand display means, said first hand display means having a first indicator portion which describes a circle as said first driven gears rotate,

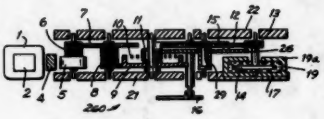
(d) a pair of second driven gears engaging said second driven gear and each having a second upstanding display hand support post thereon, said support posts pivotally supporting thereon second hand display means, said second hand display means having a second indicator portion which describes a circle as said second driven gears rotate, and

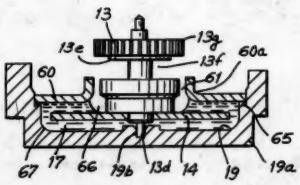
(e) a dial face supported on said frame in spaced relation to said motor and said gears such that said first and second hand display means overly said dial face and said first and second indicator portions describe circles and wherein said first hand display means and its indicator portion represent the hour display and said second hand display means and its second indicator portion represent the minute display.

4,885,730
ANALOG ELECTRONIC TIMEPIECE USING AN INTERMITTENT DRIVING SIGNAL

Osamu Miyazawa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 114,315
Claims priority, application Japan, Oct. 28, 1986, 61-256311; Nov. 7, 1986, 61-265204; Nov. 28, 1986, 61-183447[U]; Feb. 27, 1987, 62-28636[U]; Feb. 27, 1987, 62-28635[U]; Mar. 9, 1987, 62-53454; Jun. 3, 1987, 62-139281; Jul. 6, 1987, 62-168179
Int. Cl.[4] G04C *3/00*; H02K *49/10*
U.S. Cl. 368—157 31 Claims





1. An electronic timepiece including a transducer operable for producing an intermittent driving force and a hand operable for continuous rotation based on the intermittent driving force, further comprising:

energy storage means coupled to the transducer for converting the intermittent driving force to stored energy;

control means for continuously releasing the stored energy as a continuous driving force; and

linkage means coupled between the energy storage means and control means for transmitting the continuous driving force between the energy storage means and control means, for separating the energy storage means from the control means and for continually rotatably driving the hand.

4,885,731
CHILD'S EASY-TO-READ TIMEPIECE

Dominic W. Massaro, 617 Arroyo Seco, Santa Cruz, Calif. 95060

Filed Feb. 23, 1989, Ser. No. 314,401
Int. Cl.[4] G04B *19/04*
U.S. Cl. 368—228 18 Claims

1. An analog timepiece for indicating the time for use with children, mentally-disadvantaged persons, and the like comprising:

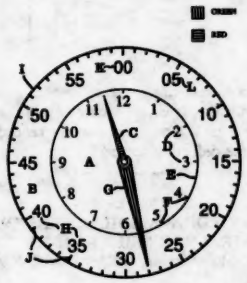
a clockface having a center portion and an outer portion, said outer portion surrounding said center portion,

each of said portions having a series of spaced division marks and numerals around a periphery thereof,

the division marks and numerals around said center portion representing successively cumulative intervals of one size,

the division marks and numerals around said outer portion representing successively cumulative intervals of a different size,

a pair of elongated hands, each of said hands having two opposite ends, one end of each hand being pivotably mounted in the center of said clockface, one of said hands being relatively short and the other hand being relatively long such that the other end of said short hand points to said division marks and numerals in said center portion



and the other end of said long hand points to said division marks and numerals in said outer portion, and

means for rotating said hands at different speeds such that said other end of each of said hands will move between adjacent division marks and numerals in its corresponding portion in respective time intervals of the size represented by such portion,

each of said hands and its corresponding periphery, marks, and numerals of said clock face having at least two visual characteristics in common,

each of said hands and its corresponding periphery, division marks, and numerals of said clockface having said at least two common visual characteristics different from those of the visual characteristics of the other of said hands and its corresponding periphery, division marks, and numerals.

4,885,732

OPTICAL PICKUP APPARATUS FOR DETECTING AND CORRECTING FOCUSING AND TRACKING ERRORS IN DETECTED RECORDED SIGNALS

Hiroshi Sunagawa, Kanagawa; Hiroshi Nishihara, Ohsaka, both of Japan, and Toshiaki Suhara, Glasgow, Scotland, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1987, Ser. No. 92,256

Claims priority, application Japan, Sep. 2, 1986, 61-206257; Sep. 2, 1986, 61-206258

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 **33 Claims**

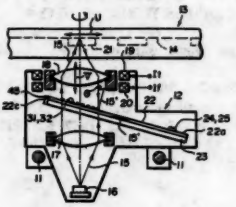
1. An optical pickup apparatus for an optical recording medium having a reflection surface, the optical pickup apparatus comprising:

a light source for emitting a light beam;

an objective lens for converging the emitted light beam onto the reflection surface of the recording medium, said objective lens being movably supported in a tracking and a focusing direction of the recording medium;

an optical waveguide disposed in such a direction that one surface thereof receives the light beam reflected by the reflection surface of the optical recording medium;

first and second focusing grating couplers each disposed next to each other and adjacent the one surface of said optical waveguide which receives the reflected light beam, said first focusing grating coupler causing the reflected light beam to enter said optical waveguide thereby forming a first optical wave and converging the first optical wave through said waveguide to a first predetermined point, said second focusing grating coupler casing the reflected light beam to enter said optical waveguide thereby forming a second optical wave and converging the second optical wave through said waveguide to a second predetermined point;



first and second set of photodetectors secured to one of a surface and an edge face of said optical waveguide for respectively detecting an amount of light at the first predetermined point and for detecting an amount of light at the second predetermined point;

a tracking control circuit, coupled to said first and second set of photodetectors, for receiving a tracking error signal and for generating a tracking correction signal in accordance with the tracking error signal;

a focusing control circuit, coupled to said first and second set of photodetectors, for receiving a focusing error signal and for generating a focusing correction signal in accordance with the focusing error signal.

4,885,733

METHOD OF, AND SYSTEM FOR, DETECTING AN EXCESSIVE LOADING CONDITION OF MULTIPLE DISKS IN A VIDEO DISK APPARATUS

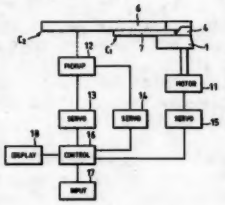
Hiroaki Tsuboi, Saitama, Japan, assignor to Pioneer Electric Corporation, Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 182,015

Claims priority, application Japan, Apr. 15, 1987, 62-92320

Int. Cl.[4] G11B *19/04*

U.S. Cl. 369—45 **10 Claims**



1. A method of detecting an excessive loading condition of multiple disks in a disk playing apparatus having a pickup means, said disks comprising at least a first disk having a first outer circumference and a second disk having a second outer circumference which is larger than said first outer circumference, said method comprising the steps of:

focusing a beam from said pickup means at a predetermined parking position which is located at a predetermined position between said first outer circumference of said first

disk and said second outer circumference of said second disk; and

monitoring for a substantial change in focusing as said pickup means is moved in a direction toward an inner circumference of said first disk, wherein a substantial change in focusing is an indication that there is an excessive loading condition of multiple disks in said disk apparatus.

4,885,734

DIFFRACTION GRATING USING BIREFRINGENCE AND OPTICAL HEAD IN WHICH A LINEARLY POLARIZED BEAM IS DIRECTED TO A DIFFRACTION GRATING

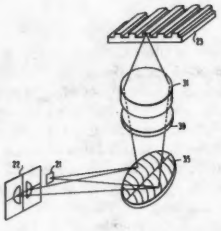
Ono Yuzo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 20, 1987, Ser. No. 75,456

Claims priority, application Japan, Jul. 18, 1986, 61-170244; Dec. 12, 1986, 61-294695; Jan. 16, 1987, 62-7582

Int. Cl.[4] G11B *7/09, 12/10;* G01J *1/20*

U.S. Cl. 369—45 **10 Claims**



1. A diffraction grating comprising a birefractive sheet having a corrugated surface to provide a grating, wherein at least each groove of said corrugated surface is filled with a mass of a material having a refractive index which is substantially equal to one of ordinary and extraordinary indices of said birefractive sheet.

4,885,735

INFORMATION RECORDING AND REPRODUCING APPARATUS WITH MANAGEMENT OF DEFECTIVE SECTOR

Yoshihisa Fukushima, Osaka; Isao Satoh, Neyagawa; Makoto Ichinose, Sakai; Yuzuru Kuroki, Toyonaka, and Yuuji Takagi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP86/00539, § 371 Date Jun. 22, 1987, § 102(e) Date Jun. 22, 1987, PCT Pub. No. WO87/02818, PCT Pub. Date May 7, 1987

PCT Filed Oct. 27, 1986, Ser. No. 76,170

Claims priority, application Japan, Oct. 28, 1985, 60-241060

Int. Cl.[4] G11B *5/012*

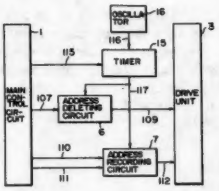
U.S. Cl. 369—59 **2 Claims**

1. An information recording and reproducing apparatus for use with a disk type information recording medium having a plurality of tracks divided into a plurality of sectors and including tracks having (a) a plurality of normal sectors in which an address is recorded in an address area in a sector ID field thereof and, (b) on the same track, at least one alternative sector in which an address has not been recorded in an address area in a sector ID field thereof; said apparatus comprising:

information recording means for recording data on a data field in a sector;

address deleting means for measuring a disk rotational period taken to an address area of a defective sector from a sector located precedent to said defective sector and for recording a delete signal on the address area of said defective sector to disable reproduction of the address area of said defective sector; and

address recording means responsive to detection of said defective sector for recording the address of said defective sector on the address area of an unused alternative sect or located on the same tract as the defective sector;



said information recording means recording information designated for the defective sector within that alternative sector having an address area thereof recorded with the address of the defective sector.

4,885,736

OPTICAL RECORDING MEDIUM WITH TRACK AND TRACK NUMBER GUIDES

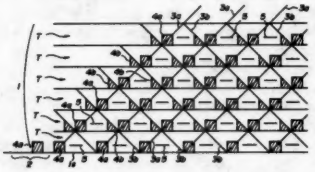
Kiyoshi Horie, Tokyo, Japan, assignor to CSK Corporation, Tokyo, Japan

Filed Aug. 21, 1987, Ser. No. 88,727

Claims priority, application Japan, Aug. 22, 1986, 61-196796

Int. Cl.[4] G06K *19/06;* G11B *7/007*

U.S. Cl. 369—275 **8 Claims**



1. An optical recording medium for use with an optical data reader used for reading data from said recording medium in a data scanning direction, said optical recording medium comprising:

a data recording region including a plurality of data tracks extending in said data scanning direction juxtaposed each other; and

a track detecting region provided at a portion of said data recording region, including

track guides juxtaposed along respective ones of said data tracks,

track number guiding means intersecting said track guides aslant, said track number guiding means corresponding to a locus of movement of an optical head of said optical data reader to access a desired track,

a first track number detecting mark positioned in the vicinity of each of the intersections of the track guides and the track number guides which extend from a leading side of the track toward a trailing side thereof, and

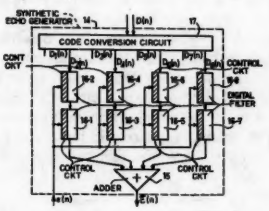
a second track number detecting mark positioned in the vicinity of each of the intersections of the track umber guides declining from the trailing side of the track towards the leading side thereof, said track towards the leading side thereof, said first track number guides and said second track number guides differing in shapes.

4,885,737

ECHO CANCELER HAVING SIMPLIFIED CALCULATION CIRCUITS

Loïc B. Y. Guidoux, La Queue lez Yvelines, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Apr. 4, 1988, Ser. No. 176,961
Claims priority, application France, Feb. 1, 1980, 80 02274
Int. Cl.[4] H04B 3/23
U.S. Cl. 370—32.1 12 Claims



1. An echo canceller associated with a data transmission modem, the modem utilizing amplitude and phase modulation, the modem including a transmit path and a receive path, such that an undesired echo signal appears in the receive path resulting from a carrier signal in the transmit path, the carrier signal having a phase and amplitude state at each modulation interval, the modem producing a predetermined number of different phase and amplitude states for functioning at a normal rate and half of the predetermined number of different states for functioning at a fall-back rate, the echo canceller comprising:

(a) first input means coupled to the transmit path for receiving a digital representation of the carrier signal, the representation indicating for each modulation interval the phase and amplitude state of the carrier signal;

(b) code conversion means coupled to receive the representation and having a plurality of parallel outputs, each of the parallel outputs providing one of the values +1, −1, and 0, so that the parallel outputs together provide distinct configurations $D_i(n)$ corresponding to the phase and amplitude states of the carrier signal, said distinct configurations satisfying the equation:

$$E[D_i(n)\cdot D_{i'}(n)]=0$$

where: the operator E represents mathematical expectation; n is an integer representing an instant of time; i and i' represent respective parallel outputs of the code conversion means and are integers between 1 and a number of the parallel outputs; $i \neq i'$; and $D_i(n)$ and $D_{i'}(n)$, are the values provided at the respective parallel outputs, said code conversion means producing 2P distinct configurations satisfying the equation for operation at said normal rate, and P of said 2P distinct configurations also satisfying the equation for operation at said fall-back rate;

(c) output means, coupled to the receive path, for providing an analog synthetic echo signal;

(d) means, disposed within the receive path, for subtractively combining the analog synthetic echo signal and the undesired echo signal to produce a residual echo signal therefrom;

(e) second input means coupled to the receive path, for supplying a digital representation of the residual echo signal; and

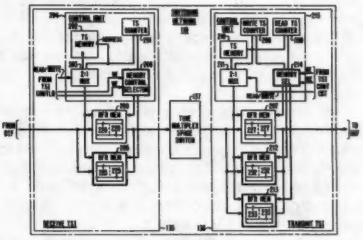
(f) a plurality of adaptive filters, coupled to receive the distinct configurations from respective ones of the parallel outputs of the code conversion means and to receive the digital representation of the residual echo signal from the second input means, having respective outputs coupled with the output means of the echo canceller, and having coefficients which are adjusted in an interactive manner in order to minimize the mean square value of the residual echo signal.

4,885,738

METHOD OF AND APPARATUS FOR ESTABLISHING A WIDEBAND COMMUNICATION FACILITY THROUGH A SWITCHED COMMUNICATIONS NETWORK HAVING NARROW BANDWIDTH TIME DIVISION MULTIPLEXED CHANNELS

Thomas E. Bowers, Warrenville; Alan E. Frey, Naperville; Howard A. Kerr, West Chicago, all of Ill.; Larry A. Russell, Aberdeen, N.J., and Roger E. Stone, Naperville, Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 815,400, Dec. 31, 1985, Pat. No. 4,704,716. This application Jul. 31, 1987, Ser. No. 80,712
Int. Cl.[4] H04Q 11/04
U.S. Cl. 370—58.1 10 Claims



1. In a switching system for communicatiing time slot data of a plurality of time frames between first and second groups of time division multiplexed (TDM) channels of relatively narrow bandwidth, apparatus for providing a windband communications path having a bandwidth wider than any of said channels and including time slot interchange means for interchanging only within a time frame time slot data of any given one of said plurality of time frames, said time slot interchange means comprises:

first memory means for storing time data,

second memory means for storing time slot data,

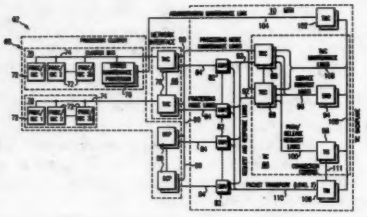
third memory means for storing time slot data, and

control means for selectively writing during first, second, and third consecutive periods of time the time slot data of a first time frame received from said first channel group into said first memory means during said first period of time, the time slot data of a second time frame received from said first channel group into one of said second and third memory means during one of said second and third periods of time, and the time slot data of a third time frame received from said first channel group into the remaining one of said second and third memory means during the remaining one of said second and third periods of time, and for reading the time slot data out of said first memory means for transmission to said second channel group during a fourth period of time subsequent to said first period of time and overlapping said second and third periods of time.

4,885,739
INTERPROCESSOR SWITCHING NETWORK

Edgar L. Read, Plano; Elwyn E. Grant, Richardson; Gary A. Keto, Rowlett; Sharlene C. Lin, Dallas; James D. Morgan, Garland; Robert E. Nimon, Arlington; Oliver G. Oldham, Garland; Allen R. Adams, Jr., and Jose A. Salmones, both of Plano, all of Tex., assignors to DSC Communications Corporation, Plano, Tex.

Filed Nov. 13, 1987, Ser. No. 120,411
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58.1 **30 Claims**



1. A switching network for providing connections between processing elements comprising:

a plurality of interface circuits for transferring information to and from respective processing nodes coupled to one or more of the processing elements;

request distributor circuitry operably connected to said interface circuits for transferring a request for communication from an initiating processing element to a selected processing element;

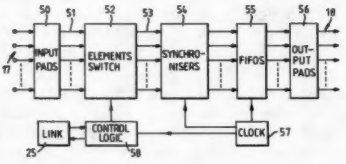
supervisor circuitry for determining whether one of said interface circuits associated with either said initiating processing element or said selected processing element is currently capable of transferring information between said initiating and selected processing elements; and

a circuit switch matrix for establishing a point to point connection between said initiating and selected processors in response to an appropriate signal from said supervisor circuitry.

4,885,740
DIGITAL SIGNAL SWITCH

Brian J. Parson; Roger M. Shepherd; Michael D. May, and Graham Stewart, all of Bristol, United Kingdom, assignors to Inmos Limited, Bristol, United Kingdom

Filed Jan. 19, 1988, Ser. No. 145,217
Claims priority, application United Kingdom, Jan. 19, 1987, 8701009
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 **19 Claims**



1. A digital signal switch for effecting a plurality of selectable interconnections between devices which communicate with each other by serial bit packets of two types, a first type being a data packet of a first format commencing with a start bit and a second type being an acknowledgement packet of a second format commencing with a start bit, said switch having a plurality of inputs, a plurality of outputs, and connecting circuitry for selectively interconnecting said inputs and outputs, said connecting circuitry having:

(a) a start bit detector for detecting a start bit of a serial bit packet which is inputted to the switch,

(b) clock circuitry providing timing signals,

(c) a buffer for holding a plurality of bits,

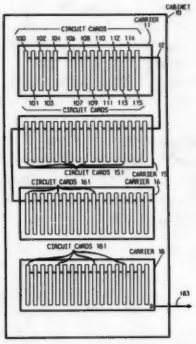
(d) input control circuitry coupled to said buffer for loading progressively into said buffer a succession of bits corresponding to a serial bit packet which is inputted to the switch, and

(e) output control circuitry coupled to said buffer for regenerating a succession of bits to form an output from said buffer corresponding to said succession of bits loaded into the buffer, said output control circuitry being operable under control of said clock circuitry to output bits progressively from the buffer as said input control circuitry loads bits progressively into said buffer.

4,885,741
DATA COMMUNICATION ARRANGEMENT WITH EMBEDDED MATRIX SWITCH

William Douskalis, Lincroft, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Aug. 3, 1988, Ser. No. 227,845
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—67 **7 Claims**



1. Data communication apparatus for use in conjunction with data terminal equipment, said apparatus comprising

a bus,

a plurality of data set means directly connected to said bus,

a plurality of access means directly connected to said bus, each access means including means independent of said data set means for receiving data from, and applying data to, said data terminal equipment,

means connected to said bus for defining data flow paths, over said bus, between ones of said access means and respective ones of said data set means, and

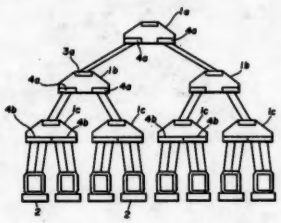
device intercommunication means for causing said access means and said data means to access said bus synchronously at respective bus access rates in such a way as to establish data flow over an individual one of the defined paths between individual pieces of said data terminal equipment and respective ones of said data set means, there being at least one pair of said rates for which neither rate of the pair is a whole number multiple of the other.

4,885,742

NODE APPARATUS AND COMMUNICATION NETWORK

Takashi Yano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,258
Claims priority, application Japan, Jan. 28, 1988, 63-15948
Int. Cl.[4] H04J 3/02, 3/24
U.S. Cl. 370—85.2 27 Claims



1. A node apparatus for a communication network having a hierarchical structure, said communication network having a plurality of transmission paths each coupling one node apparatus to another node apparatus or a terminal device, said node apparatus comprising:

at least one high order direction port having input and output channels for coupling said node apparatus to an arbitrary node apparatus which is provided in a layer which is higher in order than a layer in which said node apparatus is provided;

a plurality of low order direction ports respectively having input and output channels for coupling said node apparatus to an arbitrary node apparatus or an arbitrary terminal device which is provided in a layer which is lower in order than the layer in which said node apparatus is provided; and

control means for controlling coupling of said high order direction port and said low order direction ports,

when no signal is received at the input channel of said high order direction port and a signal is first received at the input channel of one of said low order direction ports said control means coupling the input channel of said one low order direction port to the output channels of remaining low order direction ports and said high order direction port and disconnecting the input channels of the remaining low order direction ports from the output channels of all of said low order direction ports and said high order direction port,

when a signal is first received at the input channel of said high order direction port said control means coupling the input channel of said high order direction port to the output channels of all of said low order direction ports and disconnecting the input channels of all of said low order direction ports from the output channels of all of said low order direction ports and said high order direction port regardless of whether or not a signal is received at an input channel of one of said low order direction ports.

4,885,743

METHOD AND APPARATUS FOR DETECTING THE COLLISION OF DATA PACKETS

Jan Heibers, Rochester; Frederick W. Scholl, Riverdale, and Michael H. Coden, Bronx, all of N.Y., assignors to Codenoll Technology Corporation, Yonkers, N.Y.

Filed Feb. 18, 1988, Ser. No. 157,545
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—85.2 9 Claims

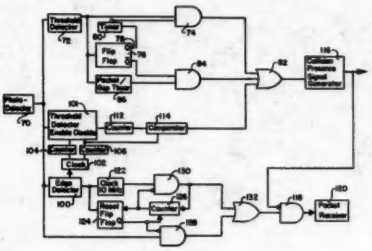
1. In a communication network, a method for detecting collisions of varying overlap among packets of binary data transmitted over said network comprising:

(a) generating in each binary data signal packet that is transmitted over the network a collision signal comprising:

(i) a large initial pulse having an amplitude greater than that of a high binary data signal level and a pulse width greater than the pulse width of a binary data signal; and

(ii) a unique first code comprising a first predetermined number of data signals in which a second predetermined number of the data signals have a first data signal level;

(b) monitoring said network continuously while data packets are being transmitted to detect collisions between data signal packets transmitted from different transmitters;



(c) producing a first error signal if a collision signal detected comprises a large pulse having a pulse width greater than the pulse width of the generated initial pulse;

(d) producing a second error signal if a collision signal detected includes a first code having a number of data signal with a first data signal level that is different from the second predetermined number of data signals having said first data signal level; and

(e) producing a third error signal if a second large pulse is detected within a time period equal to the length of the packet and the length of a gap between successive packets being transmitted;

wherein collisions of packets of binary data are detected if any one or any combination of said first, second and third error signals are produced.

4,885,744

APPARATUS FOR RECONSTRUCTING AND MULTIPLEXING FRAMES OF VARIOUS ORIGINS MADE UP OF A VARIABLE NUMBER OF PACKETS OF FIXED LENGTH

Albert Lespagnol, 33, rue de Landerval; Jean-Paul Quinquis, Rue de Cornic, both of 22700 Perros-Guirec, and Jacques Kerberenes, Kerlan, Servel, 22300 Lannion, all of France

Filed Jun. 14, 1988, Ser. No. 207,132
Claims priority, application France, Jun. 15, 1987, 87 08286
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—94 21 Claims

1. A receiving apparatus responsive to received asynchronous packets for reconstructing frames including the received asynchronous packets, each frame including a variable number of packets having the same label, said frames being delivered in multiplexed form to the receiving apparatus, said apparatus comprising:

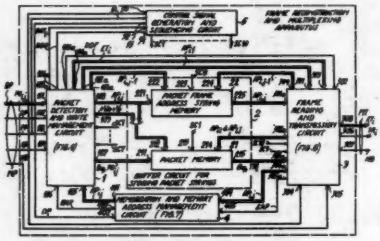
a first memory having a determined number of first locations for momentarily memorizing said received asynchronous packets, said first locations being addressed respectively by first addresses,

a second memory having a number of second locations equal to the number of locations of said first memory for momentarily memorizing strings of addresses by memorized incoming packets corresponding respectively to said frames, said second locations being respectively associ-

ated with said first locations and being addressed respectively by second addresses,

means for detecting free location couples in said memories and deriving the corresponding first and second addresses in response to reception of said packets, each location couple including a first location and the corresponding second location,

writing means responsive to said received packets and said first and second addresses derived by said free location couple detecting means, said writing means controlling writings of said packets in said first memory and writings of the corresponding first addresses in the corresponding



address strings memorized in said second memory, and for delivering string addresses corresponding to frames fully written in said first memory, and

reading means receiving said string addresses for controlling readings of said fully written frames and deriving said frames in multiplexed form, the first addresses for the reading of a fully written frame memorized in said first memory being recovered by said reading means consecutively to prior readings of the corresponding address string memorized in said second memory and the frame being read packet by packet as the first addresses are recovered in the second memory.

4,885,745

ALGORITHM FOR MINIMIZING EXCURSION IN PLACEMENT OF CHANNEL SELECTS INTO MULTIPLEXER FRAME

David P. Gordon, Stamford, Conn., assignor to General DataComm, Inc., Middlebury, Conn.

Filed Oct. 19, 1988, Ser. No. 259,855
Int. Cl.[4] H04J *3/12*
U.S. Cl. 370—110.1 **20 Claims**

1. A method for ordering selects for a plurality of channels into a multiplexer frame, comprising:

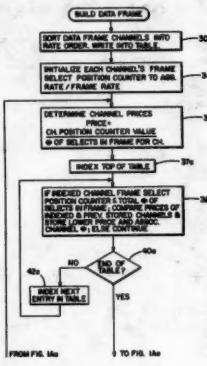
(a) providing a channel select position counter for each of said plurality of channels;

(b) initializing said channel select position counters to a value corresponding to the total number of selects in said frame;

(c) choosing a select of a ready channel at least based on respective prices of said channels, wherein a channel is deemed a ready channel according to a comparison of the value of its channel select position counter to said value corresponding to the total number of selects in said frame, and wherein a channel having a relatively lower price is always chosen over a channel having a relatively larger price, and the price of a channel corresponds to a value of the position counter of that channel divided by a valaue corresponding to the number of selects of that channel in the frame;

(d) changing the position counter of a selected channel by said value corresponding to the total number of selects in said frame;

(e) changing the position counter of each channel, including said selected channel by a value corresponding to the number of selects in said frame for that particular channel; and


BUILD DATA FRAME
SORT DATA FRAME CHANNELS INTO RATE ORDER, WRITE INTO TABLE
INITIALIZE EACH CHANNEL'S FRAME SELECT POSITION COUNTER TO ASS. RATE / FRAME RATE
DETERMINE CHANNEL PRICES PRICE= CH. POSITION COUNTER VALUE ⊕ OF SELECTS IN FRAME FOR CH.
INDEX TOP OF TABLE
IF INDEXED CHANNEL FRAME SELECT POSITION COUNTER ≤ TOTAL ⊕ OF SELECTS IN FRAME, COMPARE PRICES OF INDEXED & PREV. STORED CHANNELS & STORE LOWER PRICE AND ASSOC. CHANNEL ⊕; ELSE CONTINUE
NO
END OF TABLE?
YES
INDEX NEXT ENTRY IN TABLE
FROM FIG. 1Aa
TO FIG. 1Ac

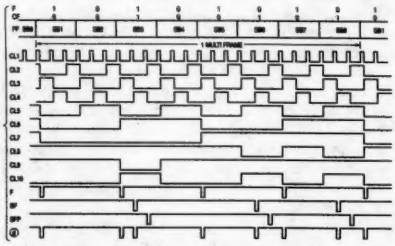
(f) repeating steps (c)–(e) until said frame is substantially filled with selects.

4,885,746

FREQUENCY CONVERTER

Takeo Fukushima, Kawasaki; Masami Mizuguchi, Yokohama; Takahiro Furukawa, Tokyo; Yoshiaki Yato, Mitaka; Kenji Sato, Yokohama; Naonobu Fujimoto, Kawasaki, and Tetsuro Murase, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 657,663, Oct. 4, 1984, abandoned. This application Apr. 29, 1985, Ser. No. 728,191
Claims priority, application Japan, Oct. 19, 1983, 58-195593
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—102 **2 Claims**



1. A method of converting from a first frequency to a second frequency in a multiplexed signal, comprising the steps of:

(a) determining a first number of dummy pulses in dependence upon a frequency ratio between the first and second frequencies;

(b) inserting the first number of dummy pulses into a first number of frames of the multiplexed signal;

(c) inserting a single pulse into each of a second number of the frames of the multiplexed signal, the single pulse used for frame synchronization of frames of the multiplexed signal and for indicating one of existence and non-existence of a second number of the dummy pulses in a corresponding frame, the single pulse having a first logic level representing existence of the second number of dummy pulses and a second logic level representing non-existence of the second number of dummy pulses and the frequency ratio corresponding to a logic level ratio of a third number

of frames containing the single pulse with the first logic level divided by a fourth number of frames containing the single pulse with the second logic level.

4,885,747

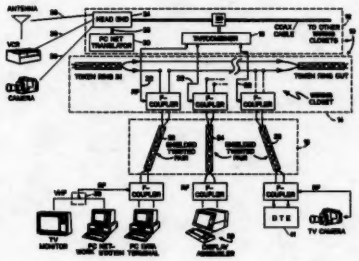
BROADBAND AND BASEBAND LAN

Henry R. Foglia, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 17, 1988, Ser. No. 156,763

Int. Cl.[4] H04J *1/00*

U.S. Cl. 370—123 **26 Claims**



1. An improved communications system for transmitting and receiving broadband and baseband information comprising:

a backbone communications network, said backbone communications network having a first sub-assembly network dedicated to transmit broadband signals representative of broadband information, a second sub-assembly network dedicated to transmit baseband signals representative of baseband information;

a distribution communications network for simultaneously transmitting and/or receiving broadband signals and baseband signals; and

a circuit arrangement coupling the backbone communications network and the distribution communications network, said circuit arrangement having a filter circuit means connected in tandem with a broadband transformer with the windings of said transformer causing the baseband signals to be transmitted in a balanced mode and the broadband signals to be transmitted in an equally unbalanced mode.

4,885,748

METHOD AND CIRCUIT CONFIGURATION OF THE PARALLEL INPUT OF DATA INTO A SEMICONDUCTOR MEMORY

Kurt Hoffmann, Taufkirchen; Hans-Dieter Oberle, Puchheim; Rainer Kraus, Munich; Oskar Kowarik, Grafing, and Manfred Paul, Unterfoehring, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,668

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1987, 3708527

Int. Cl.[4] G11C *29/00*

U.S. Cl. 371—21.3 **13 Claims**

6. Circuit configuration for the parallel input of data items in the form of a test pattern into a block of a semiconductor memory, comprising:

a semiconductor memory including at least one block having 2^{N+M} storage cells disposed in the form of a matrix;

word lines and internal bit lines connected to said storage cells for addressing said storage cells;

word line decoders connected to said word lines for activating said word lines, bit line decoders connected to said internal bit lines for activating said internal bit lines;

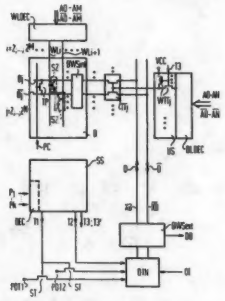
internal evaluator circuits each being assigned to a respective one of said internal bit lines and dividing said internal bit lines into two halves;

transfer transistor pairs each being connected to a respective one of said internal evaluator circuits; an external collective bit line being connected to said transfer transistor pairs and having first and second halves;

a data input circuit; an external evaluator circuit connected between said external collective bit line and said data input circit for amplifying data read out from said semiconductor memory, for transmitting the amplified data, for receiving data input in the form of logic levels into said semiconductor memory from said data input circuit and for transferring the received data to said external collective bit line;

switching transistors each being connected to a respective one of said data input circuits for feeding respective potentials each having one of two logic levels, to said data input circuit;

a control circuit having an input receiving control signals



containing information as to whether or not parallel input is to take place and as to which test pattern is to be used therefor;

said control circuit having a first output connected to one of said switching transistors for feeding a first output signal driving said one switching transistor, said control circuit having a second output connected to said data input circuit for feeding a second output signal controlling said data input circuit as to which of said potentials is to be applied as said first logic level through said external evaluator circuit to said first half of said external collective bit line and which of said potentials is to be applied as said second logic level through said external evaluator circuit to said second half of said external collective bit line, said control circuit having at least one third output connected to said bit line decoders for feeding at least one third output signal; and

said bit line decoders having a switch-over device receiving said at least one third output signal for parallel activation of at least a plurality of said transfer transistor pairs.

4,885,749

DATA TRANSMISSION WITH IMPROVED MESSAGE FORMAT

Glenn D. Golden, Tinton Falls, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Dec. 28, 1987, Ser. No. 137,996

Int. Cl.[4] G08C *25/00*; G06F *11/10*

U.S. Cl. 371—32 **20 Claims**

1. A data transmission system comprising:

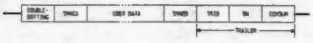
a first modem including means for generating a line signal which represents a stream of user data followed by a predetermined delimiting signal followed by a trailer

which contains information-bearing data generated from within said first modem, and

a second modem for receiving said line signal, said second modem including:

a received data lead,

means for providing an indication of the presence of valid received user data on said received data lead, and



means for terminating said indication in response to the receipt of said delimiting signal,

whereby terminal equipment associated with said second modem is enabled to initiate the transmission of data at a point in time at which the portion of said line signal containing said trailer is still being received by said second modem.

4,885,750

METHOD AND APPARATUS FOR ERROR CORRECTION

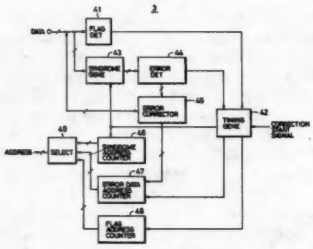
Koji Tanaka; Kazunori Nishikawa, both of Tokyo, and Kazuya Yamada, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 16, 1988, Ser. No. 156,511

Claims priority, application Japan, Feb. 14, 1987, 62-32153

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—37.4 **2 Claims**



1. An apparatus for correcting errors in a digital signal, the digital signal having frames each composed of n data words and a parity code, one data word having m bits, the letters n and m representing natural numbers equal to or greater than 2, the apparatus comprising:

(a) a memory;

(b) means for writing one frame of data words into the memory;

(c) means for writing a write end flag into the memory when writing of one frame of the data words into the memory is completed;

(d) means for detecting the write end flag written in the memory;

(e) means for, after the detection of the write end flag, reading out the data words from the memory; and

(f) means for detecting an error from the read data words and correcting the error.

4,885,751

DEVICE FOR MODULATING A LASER BEAM

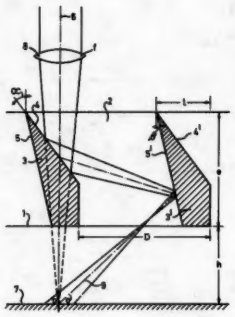
Frédéric Terreur, Fleron, Belgium, assignor to Centre De Recherches Metallurgiques Centrum Voor Research in De Metallurgie, Brussels, Belgium

Filed Sep. 12, 1988, Ser. No. 242,974

Claims priority, application Belgium, Sep. 11, 1987, 08701027

Int. Cl.[4] H01S *3/10*; B05D *25/00*; B23K *27/00*

U.S. Cl. 372—26 **9 Claims**



1. A device for modulating a laser beam focussed on a moving surface, the device comprising a rotary member having a plurality of through-orifices and being revolvable in said beam so as to allow at least part of said beam to pass intermittently through said orifices, wherein said orifices have radial lateral faces which are inclined relative to the axis of said beam, the angles of inclination of the opposed radial lateral faces of at least one of said orifices being different from each other and the difference in inclination being such that the laser beam deviated by one radial lateral face is then reflected by the opposite radial lateral face towards the zone of said moving surface which is struck by said beam passing through said orifice without being deviated.

4,885,752

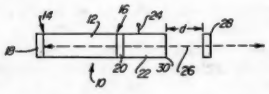
CRYSTAL MODULATED LASER WITH IMPROVED RESONATOR

Kuei-Ru Chien, Cerritos; Kin-Kwok Hui, Monterey Park; H. Dean Stovall, Los Angeles; John H. S. Wang, Rancho Palos Verdes, Calif., and Albert J. Lamm, Fremont, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 28, 1988, Ser. No. 174,299

Int. Cl.[4] H01S *3/00*

U.S. Cl. 372—33 **14 Claims**



1. A crystal modulated laser having pumping means for imparting a given amount of energy per unit time into a medium, comprising:

a laser gain medium having first and second ends;

a first reflecting means positioned generally adjacent said first end;

an outcoupler reflecting means positioned generally adjacent and spaced from said second end;

a crystal modulator positioned generally adjacent said second end and between said second end and said outcoupler reflecting means;

said crystal modulator being receptive of laser light and being heated thereby, the heating causing thermal lensing in said crystal modulator; and

said outcoupler reflecting means being spaced apart from said crystal modulator by a predetermined distance for substantially compensating for said thermal lensing in said crystal, said predetermined distance being a function of the energy imparted per unit time by said pumping means.

4,885,753
SEMICONDUCTOR LASER DEVICE OF VARIABLE WAVELENGTH TYPE

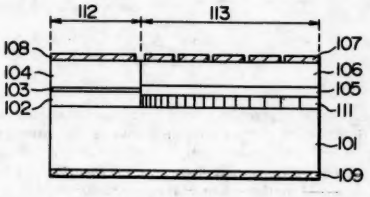
Makoto Okai, Koganei; Kazuhisa Uomi, Hachioji, both of Japan; Shinji Tsuji, Red Bank, N.J.; Shinji Sakano, Hachioji, and Naoki Chinone, Chofu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 256,318

Claims priority, application Japan, Oct. 9, 1987, 62-253617

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—45 **22 Claims**



1. A semiconductor laser device comprising:

a substrate;

an active region formed on the substrate, the active region including an active layer capable of generating light in accordance with carriers injected therein;

a pair of electrodes for injecting the carriers into the active layer;

a feedback region formed on the substrate, the feedback region including an optical guide region and a perturbation portion optically coupled to said optical guide region, the optical guide region guiding the light from the active layer, the perturbation portion having non-uniform perturbation distribution; and

means for changing the degree of coupling of the light in the feedback region and a part of the perturbation region.

4,885,754
HIGH FREQUENCY DISCHARGE EXCITATION LASER DEVICE

Akira Egawa, Yamanashi, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

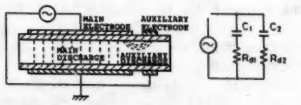
PCT No. PCT/JP87/01012, § 371 Date Aug. 18, 1988, § 102(e) Date Aug. 18, 1988, PCT Pub. No. WO88/04844, PCT Pub. Date Jun. 30, 1988

PCT Filed Dec. 22, 1987, Ser. No. 243,566

Claims priority, application Japan, Dec. 23, 1986, 61-305533

Int. Cl.[4] H01S *3/097*

U.S. Cl. 372—86 **7 Claims**



1. A high frequency discharge excitation laser device, comprising:

a discharge tube made of dielectric material for generating a discharge for laser light oscillation in an active laser gas flowing therethrough;

a plurality of main electrodes disposed on an external surface of said discharge tube;

a power source circuit for supplying a high frequency voltage between said main electrodes to generate a laser light oscillation discharge in said discharge tube; and

an auxiliary electrode disposed on the external surface of said discharge tube wherein a distance between said main electrodes and said auxiliary electrode is less than a distance between said main electrodes, such that an auxiliary discharge is generated between said main electrodes and said auxiliary electrode in addition to a main discharge between said main electrodes.

4,885,755
METHOD AND APPARATUS FOR DATA COMMUNICATION

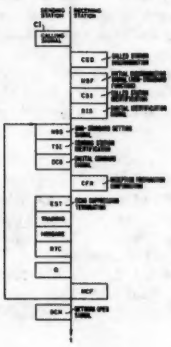
Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1986, Ser. No. 847,684

Claims priority, application Japan, Apr. 10, 1985, 60-75938; Apr. 10, 1985, 60-75939; Apr. 17, 1985, 60-81841

Int. Cl.[4] H04B *15/00*

U.S. Cl. 375—58 **15 Claims**



1. A data communication apparatus, comprising:

data communication means for performing a data communication;

pre-procedure means for performing a pre-procedure for the data communication;

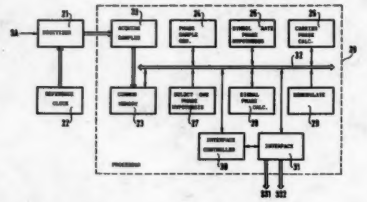
interpage procedure means for performing, in a case where data communication of data corresponding to plural pages is performed by said data communication means, a procedure or the data communication every time communication of a page of data is completed; and

stop signal sending means for sending a stop signal to stop and echo suppressor function on a communication network immediately before the data communication, in order to execute a communication in the pre-procedure and an interpage procedure in a half duplex mode and to execute the data communication in a full duplex mode.

4,885,756
METHOD OF DEMODULATING DIGITALLY MODULATED SIGNALS, AND APPARATUS IMPLEMENTING SUCH A METHOD

Sylvain Fontanes, Chatou; Patrice Birot, Courbevoie; André Marguinaud, Palaiseau; Thierry Quignon, Nanterre, and Brigitte Romann, Boulogne Billancourt, all of France, assignors to Societe Anonyme dite: Alcatel Espace, Courbevoie, France

Filed May 23, 1988, Ser. No. 197,196
Claims priority, application France, May 21, 1987, 87 07129
Int. Cl.[4] H03D *3/18*
U.S. Cl. 375—82 **13 Claims**

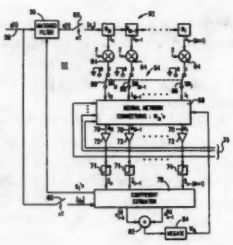


1. A digital method of demodulating digitally modulated signals, said method comprising the steps of:
- acquiring digitized samples of said signals;
- calculating phase samples from said digitized samples and storing said phase samples;
- generating a plurality of symbol rate phase hypotheses on the basis of said stored phase samples;
- calculating a carrier phase from said phase samples for each of said plurality of hypotheses, selecting one of said calculated carrier phases and its corresponding symbol rate phase hypothesis to obtain a selected carrier phase and symbol rate phase over a predetermined number of symbols; and
- demodulating said digitally modulated signals by comparing the selected carrier phase to the phase of said digitally modulated signal during a symbol under consideration.

4,885,757
DIGITAL ADAPTIVE RECEIVER EMPLOYING MAXIMUM-LIKELIHOOD SEQUENCE ESTIMATION WITH NEURAL NETWORKS

John D. Provence, Mesquite, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 1, 1987, Ser. No. 57,887
Int. Cl.[4] H03D *1/04*
U.S. Cl. 375—96 **39 Claims**

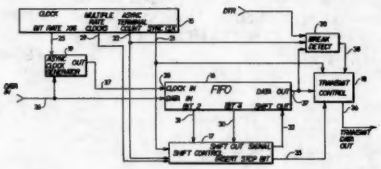


1. A digital receiver for maximum-likelihood sequence estimation of digital signals transmitted over a time-dispersive transmission channel, comprising:
- a matched filter with an input for receiving signals transmitted over the transmission channel; and
- a neural network for receiving sampled signals output by said matched filter and for providing output signals of said receiver which are estimates of signals initially transmitted over said transmission channel.

4,885,758
SPEED CORRECTION AND STOP BIT CONTROL CIRCUIT FOR DATA COMMUNICATIONS DEVICE

Stephen J. Speckenbach, Oakland, Calif., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Jun. 6, 1988, Ser. No. 203,229
Int. Cl.[4] H04L *7/02*
U.S. Cl. 375—118 **6 Claims**



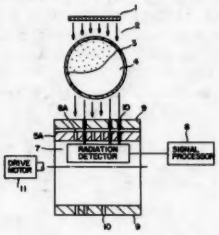
1. A data speed correction circuit for use in a data communications device of the type requiring a transmit bit stream at a predetermined bit rate plus or minus first and second tolerance values, respectively, and which is required to accept an input bit stream at said predetermined bit rate plus or minus third or fourth tolerance values, respectively, wherein said first tolerance value is less than said third tolerance value and said second tolerance value is less than said fourth tolerance value, comprising in combination:
- a data input port for receiving said input bit stream;
- clock means for generating an output bit clock signal for said transmit bit stream having a frequency corresponding to said predetermined bit rate plus or minus said first and said second tolerance values, and a character rate terminal count signal;
- a FIFO register for accepting said input bit stream from said data input port, for providing FIFO output data signals at a FIFO output, and for shifting out said FIFO output data signals in response to a shift out signal;
- said FIFO including means for detecting the presence of a data bit at a first predetermined FIFO location to provide a first FIFO bit signal and for detecting the presence of a data bit a second predetermined FIFO location to provide a second FIFO bit signal;
- shift control means connected to said clock means and said FIFO for
  - (a) providing an underspeed signal in response to an absence of said first FIFO bit signal (BIT 4) and said character rate terminal count signal;
  - (b) providing said shift out signal a predetermined period of time after each occurrence of a transition of a predetermined sense in said output bit clock signal in the absence of said underspeed signal;
  - (c) providing said shift out signal in response to said second FIFO bit signal (BIT 2) and said character rate terminal count signal; and
  - (d) inhibiting said shift out signal from occurring upon a next said occurrence of said transition of said predetermined sense in said output bit clock signal in response to said underspeed signal; and
- a transmitted data control means connected to said clock means and said FIFO output for transmitting said transmit bit stream from said FIFO output in response to said transitions of a predetermined sense in said output bit clock signal and for providing and transmitting an inserted stop bit in response to said underspeed signal.

4,885,759

MEASUREMENT APPARATUS EMPLOYING RADIATION

Toshimasa Tomoda; Shinji Badono, and Masaki Komaru, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan and Petro-Canada, Inc., Canada

Filed Nov. 24, 1987, Ser. No. 124,558
Claims priority, application Japan, Nov. 25, 1986, 61-280553
Int. Cl.[4] G01N 23/06
U.S. Cl. 378—53 8 Claims



1. A measuring apparatus for determining the spatial average of a physical property of a substance, comprising:

irradiating means for irradiating said substance with radiation;

radiation detecting means for measuring the intensity of the radiation which is incident upon said radiation detecting means and producing a corresponding output signal, said radiation detecting means being disposed on the opposite side of said substance from said irradiating means;

a mask for enabling the radiation from said irradiating means to reach said radiation detecting means only along n different pathways which pass through said substance, wherein n is an integer greater than 1, said mask being disposed between said radiation detecting means and said substance, said mask having n different mask patterns, each of said mask patterns comprising a plurality of pattern elements which transmit the radiation;

drive means for individually moving each of said mask patterns into a position such that each of the pattern elements is aligned with one of said pathways; and

processing means for processing said corresponding output signal from said radiation detecting means and producing a second output signal corresponding to said physical property of said substance.

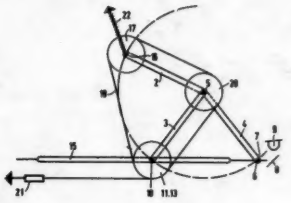
4,885,760

X-RAY ANALYSIS APPARATUS

Maurits W. Van Tol, and Johannes H. A. Bliter, both of Almelo, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 27, 1988, Ser. No. 250,023
Claims priority, application Netherlands, Oct. 16, 1987, 8702475
Int. Cl.[4] G01T 1/36
U.S. Cl. 378—82 3 Claims

1. An X-ray analysis apparatus, comprising an X-ray source, a crystal holder and a detection device, the detection device being arranged on a first arm while the crystal holder is arranged on a second arm, the first and the second arm being pivotably coupled to one another at a first pivot point at a distance from the detection device and the crystal holder, respectively, a third arm pivotably coupled at said first pivot point to the first arm and the second arm, the third arm also being pivotable, at a distance from said first pivot point, about a rigidly arranged pivot shaft, an end of the second arm supporting the crystal holder being displaceable along a straight path; the detection device, the crystal holder and the pivot shaft of the third arm being adjustable in different positions with respect to one another by pivoting the first, second, and third arms, so that the detection device, the crystal holder and the pivot shaft are positioned on a Rowland circle; said X-ray analysis apparatus further characterized in that a wheel is rigidly connected to the detection device; the first pivot point and the second arm, near the crystal holder, each further comprise a freely rotatable wheel wherein the diameters of



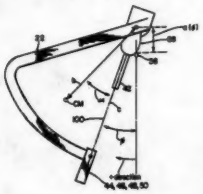
both freely rotatable wheels are the same; and around the freely rotatable wheels there being guided a belt, one end of the belt is attached to the second arm at the area of the crystal holder, the belt being guided from this area of attachment successively along the wheel connected to the detection device, the freely rotatable wheel of the first pivot point and the freely rotatable wheel of the second arm located near the crystal holder, an other end of the belt being attached to a fixed point.

4,885,761

GRAVITY ACTUATED X-RAY SCANNER

Richard A. Sones, Cleveland Heights; Mike M. Tesic, Cleveland, and James F. Vidmar, Willoughby Hills, all of Ohio, assignors to Picker International, Inc., Cleveland, Ohio

Filed May 15, 1986, Ser. No. 863,328
Int. Cl.[4] H05G 1/02
U.S. Cl. 378—197 41 Claims



1. A radiographic imaging scanner system comprising:

(a) a source of propagating penetrative radiation through a portion of a subject to emerge therefrom in a pattern;

(b) a radiation detector spaced from the source and positioned to receive said pattern of radiation;

(c) means for mounting said detector for gravity powered scanning movement including both rotational and translational movement during radiation production along a path defining a curved line substantially in a vertical plane;

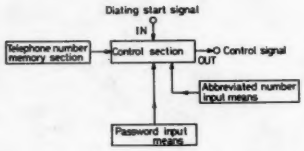
(d) means for regulating gravitational potential energy of said detector to fall at a rate during said gravity powered scanning movement to cause application of substantially uniform torque to effect said rotational movement over a predetermined angular displacement;

(e) means associated with said detector for producing an image representing said received radiation.

4,885,762
TELEPHONE APPARATUS

Katsuo Suzuki, and Kazuyuki Umebayashi, both of Tokyo, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Mar. 31, 1988, Ser. No. 176,066
Claims priority, application Japan, Mar. 31, 1987, 62-80748
Int. Cl.[4] H01M 1/27
U.S. Cl. 379—58 6 Claims

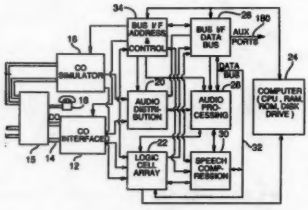


1. A telephone apparatus comprising:
abbreviated number input means for inputting an abbreviated number in a predetermined form;
password input means for inputting a password in a predetermined form;
a telephone number memory section for storing terminating subscriber's telephone numbers in correspondence with combinations of abbreviated numbers and passwords; and
a control section for selecting and outputting a terminating subscriber's telephone number from said telephone number memory section in response to a dialing start signal and on the basis of a combination of an abbreviated number and a password included in said dialing start signal.

4,885,763
VOICE MAIL SYSTEM WITH IMPROVED DETECTION AND CANCELLATION

Dennis J. O'Brien, West Linn; Paul G. Hanson, Portland; Thomas D. Klarquist, Beaverton; Bruce C. Nepple; Michael C. Park, both of Portland, and Robin R. Rosas, Beaverton, all of Oreg., assignors to AT&E Corporation, San Francisco, Calif.

Filed Dec. 1, 1987, Ser. No. 127,338
Int. Cl.[4] H04M 1/65
U.S. Cl. 379—67 1 Claim

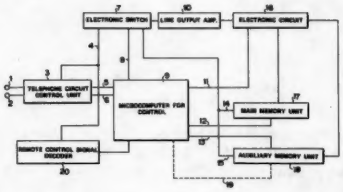


1. In a voice mail system having a source for playing back a previously recorded audio message, apparatus for differentiating between a recorded DTMF signal recorded in the audio message and a user-generated DTMF signal, comprising:
a tone detector for detecting a tone in DTMF signals, the tone detector having mreans for generating an interrupt signal to indicate a tone's presence, the tone detector further including means for requiring a detected tone to persist for a predetermioned time before generating the interrupt signal to prevent transients from prompting the generation of said interrupt signal;
a switch coupled between the source of the recorded audio message and the tone detector; and
computer means receiving a detected tone and responsive to the interrupt signal for determining if the DTMF signal producing the tone is a valid command, the computer means controlling the switch to interrupt transmission of the recorded audio message to the tone detector for a predetermined time, determining if the tone is still present during the predetermined time, and recognizing the tone as a valid command ifd still present and ignoring the tone as invalid if absent during the predetermined time.

4,885,764
AUTOMATIC ANSWERING TELEPHONE SYSTEM USING MAIN AND AUXILIARY RECORDING MEDIUMS

Hirohide Miwa, Kawasaki-shi, Kanagawa-Ken, Japan, assignor to Tokyo Koshumosu Denki Kabushiki Kaisha

Filed Sep. 25, 1987, Ser. No. 101,080
Claims priority, application Japan, Oct. 1, 1986, 234002
Int. Cl.[4] H04M 1/65
U.S. Cl. 379—70 7 Claims



1. An automatic answering telephone system having a main recording medium having a waiting period when shifted between the recording state to the playback state during receipt of and subsequent playback of messages comprising
an auxiliary recording medium in addition to said main recording medium, control means adapted to conduct incoming message/messages from an incoming telephone line for storage first in said auxiliary recording medium and then any subsequent incoming message/messages in said main recording medium, and means for first playing back the incoming message/messages recorded in said auxiliary storage medium while rewinding said main recording medium during playback of said auxiliary recording medium, and thereafter playing back said main recording medium.

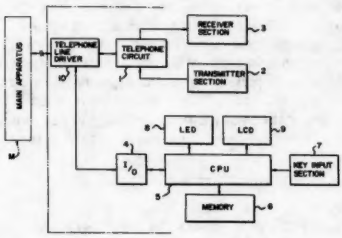
4,885,765
TELEPHONE SYSTEM WITH STIMULUS OPERATION OR DEFAULT OPERATION

Masakazu Shirakawa, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 14, 1987, Ser. No. 108,223
Claims priority, application Japan, Oct. 15, 1986, 61-244575
Int. Cl.[4] H04M 11/00
U.S. Cl. 379—93 9 Claims

1. A telephone system comprising:
a main apparatus for generating at least an information entity to be recognized and an attribute identifier for representing a specific recognition of the information entity; and
a telephone terminal apparatus, coupled to said main apparatus via a telephone line to cause a stimulus operation in which said main apparatus controls said telephone terminal apparatus, said telephone terminal apparatus having
(a) means for determining the attribute identified;
(b) means for storing previously registered data associated with the specific recognition of the information entity;
(c) means for retrieving the previously registered data stored in said storing mans in accordance with the attribute identifier determined by said determining means;
(d) means for implementing, when the previously regis-

tered data is retrieved, the information entity with the previously registered data, so that the telephone terminal apparatus executes the specific recognition of the information entity according to the previously registered data implemented by said implementing means even during the stimulus operation, and executes a



default operation in response to the attribute identifier and the information entity from said main apparatus; and

(e) means for outputting the information entity from said implementing means in accordance with said previously registered data.

4,885,766

REMOTE CONTROL DEVICE USING A TELEPHONE LINE

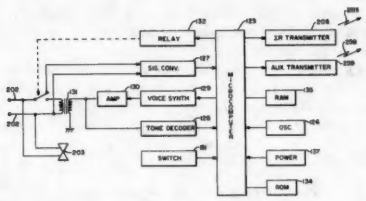
Norio Yasuoka; Takehiro Kobayashi; Nobuharu Hikida; Yasuyuki Hatakeyama; Yoshiyuki Aoto, and Jiro Itogawa, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 170,117, Mar. 16, 1988, abandoned, which is a continuation of Ser. No. 8,840, Jan. 30, 1987, abandoned. This application Jan. 11, 1989, Ser. No. 296,281

Claims priority, application Japan, Jan. 31, 1986, 61-20455; Mar. 4, 1986, 61-47649; May 14, 1986, 61-74709[U]; May 27, 1986, 61-122471; May 27, 1986, 61-122470; Jun. 30, 1986, 61-155782; Jul. 1, 1986, 61-155678; Aug. 13, 1986, 61-125000[U]; Sep. 16, 1986, 61-219011; Dec. 10, 1986, 61-293767

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—105 13 Claims



1. A remote control device comprising

memory means for storing data transmitted through a telephone line for the operation of selected apparatus,

control means for controlling said selected apparatus according to said data stored in said memory means, said control means including an infrared light transmitter and controlling said selected apparatus according to said data by transmitting control signals to said apparatus through said infrared light transmitter, and

testing means for testing whether said infrared signal light transmitter is properly functioning for the purpose of remote control, said testing means including means for selecting one of a plurality of ports through which current passes to said infrared light transmitter.

2. A remote control device comprising

memory means for storing data transmitted through a telephone line for the operation of selected apparatus,

control means for controlling said selected apparatus according to said data stored in said memory means, said control means controlling said selected apparatus according to said data by transmitting control signals to said apparatus through cordless transmitting means, said control means including a signal transmitter assembly having a plurality of wave emitters affixed at different vertical angles with respect to a rotatably supported horizontal board.

4,885,767

BLUE-BOX FRAUD PREVENTION

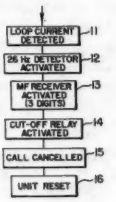
John L. Therrien, 201 Fireside Dr., Constance Bay, Ontario, Canada K0A 3M0

Filed Sep. 29, 1988, Ser. No. 251,084

Claims priority, application Canada, Sep. 29, 1987, 548073

Int. Cl.[4] H04M *1/66*

U.S. Cl. 379—189 9 Claims



1. A method of detecting a fraudulent toll telephone call made by means of a device coupled to a telephone, which device can generate a single-frequency (SF) tone control signal and multifrequency (MF) signals used in a toll telephone network, said method comprising the steps of:

(a) identifying an off-hook condition on a toll analog SF trunk line by detecting loop current on said trunk, and

(b) detecting on said trunk an SF tone control signal indicating an on hook condition, followed by a predetermined number of MF control signals.

5. Apparatus for detecting a fraudulent toll telephone call made by means of a device coupled to a telephone, which device can generate a single-frequency (SF) tone control signal and multi-frequency (MF) signals used in a toll telephone network, said apparatus comprising:

(a) monitoring means for producing a first signal indicative of an off-hook condition on a toll analog SF trunk,

(b) detection means activated in response to said first signal for detecting an SF tone control signal indicating an on hook condition and producing a second signal indicative thereof,

(c) MF receiver means activated in response to said second signal for detecting MF control signals and,

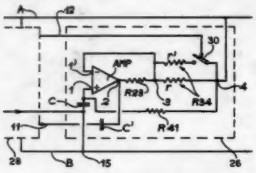
(d) switching means, responsive to receipt of a predetermined number of MF signals by said MF receiver, for effecting cancellation of said fraudulent call.

4,885,768

ACTIVE DIPOLE TELEPHONE LINE PROTECTION DEVICE

Jacques Genin, 12 rue Raffet, 75016 Paris, France

Filed Sep. 29, 1988, Ser. No. 250,907
Claims priority, application France, Oct. 1, 1987, 87 13579
Int. Cl.[4] H04M 1/66
U.S. Cl. 379—200 5 Claims



1. A telephone protection device in a two wire subscriber line comprising:

a NOT-circuit inserted between said two subscriber wires, said circuit assuming two states, namely one with high impedance allowing for normal functioning of the line and the other state with low impedance prohibiting the functioning of said line,

a management module disposed between the two wires, said module controlling feeding, line state detection and circuit control functions in said low and high impedance states;

wherein said NOT-circuit comprises an active dipole further comprising an operational amplifier, said dipole providing for said low and high impedances; and

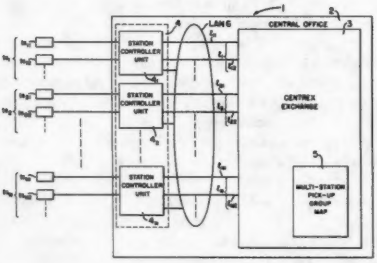
wherein irrespective of the type of dialling signal signal on said line and said low and high impedance states, said amplifier is responsive to dialling attempt signals to provide at an output, signals which are able to be analyzed, said output being connected to the management module.

4,885,769

STATION CONTROLLER FOR ENHANCED MULTI-LINE PICK-UP IN CENTREX EXCHANGE TELEPHONE SYSTEM

John D. Beierle, Danbury, Conn., assignor to Nynex Corporation, New York, N.Y.

Filed Dec. 23, 1988, Ser. No. 289,905
Int. Cl.[4] H04M 3/42
U.S. Cl. 379—210 30 Claims



1. A telephone system comprising:

a plurality of telephone stations including one or more multi-station pick-up groups, each pick-up group having a primary station and one or more associated secondary stations for picking-up calls to the primary station, and each secondary station of a pick-up group including lamp means for indicating the status of the primary station of the pick-up group and means for generating a pick-up signal for initiating the pick-up of a call to the primary station of the pick-up group;

a centrex exchange for managing the flow of telephone calls to and from said telephone stations, said centrex exchange being responsive to the pick-up signal generated by each secondary station of a pick-up group and including means for transferring a call from a primary station in a pick-up group to a secondary station in the pick-up group in response to a pick-up signal from the secondary station;

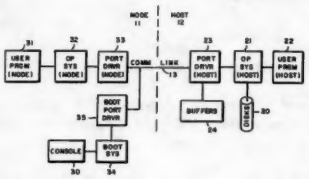
and station controller means interposed between said telephone stations and said centrex exchange, said station controller means monitoring the status of the primary station of each pick-up group and generating a signal for controlling the state of the lamp means in each of the secondary stations of the pick-up group in dependence on the monitored status of the primary station of the pick-up group.

4,885,770

BOOT SYSTEM FOR DISTRIBUTED DIGITAL DATA PROCESSING SYSTEM

John Croll, Acton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 4, 1987, Ser. No. 93,811
Int. Cl.[4] H04Q 9/00
U.S. Cl. 379—269 10 Claims



1. A digital processing system, telecommunications system, telephone system, or network system comprising a host and a node interconnected by a communications link,

A. said node comprising:

i. boot image initiation means responsive to the receipt of a boot command for transmitting a boot image transfer request to said host over said communications link;

ii. boot image retrieval means responsive to boot image pointer information received from said host over said communications link for iteratively retrieving from said host portions of said boot image identified by said boot image pointer information;

B. said host comprising means responsive to a boot image transfer request from said node over said communications link for generating boot image pointer information and transferring it to said node over said communications link.

4,885,771

INFORMATION STORAGE SYSTEM

Brian Rabideau; William D. Laughlin, both of St. Catharines; Kenneth Kissman, Welland, and Anthony T. Nicowski, St. Catharines, all of Canada, assignors to Vision II Technology Inc., St. Catharines, Canada

Filed Apr. 21, 1988, Ser. No. 184,417
Int. Cl.[4] H04M 1/27
U.S. Cl. 379—354 7 Claims

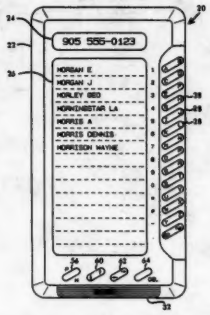
1. An information storage system for the storage of a plurality of designations and associated respective telephone numbers, for the selection and display of selected designations having a common search parameter, for selection of an individual displayed designation and display of the respective telephone number, and for the automatic dialling of the displayed telephone number, the system comprising:

information storage means for storing a plurality of information designations and the respective telephone numbers;

search, select and retrieve means for searching the information storage means and retrieving therefrom a selected information designation or a plurality of selected information designations having a selected search parameter;

multiple-line display means for the display of the selected information designations having the common search parameter, each designation being displayed on a respective line;

multiple switch means having at least one line switch adjacent to and associated with each respective line of the display means, each line switch being enabled to select the respective line and an information designation displayed thereon, whereby upon such selection by actuation of the



respective line switch the corresponding telephone number is displayed for inspection, the number of said line switches provided by the multiple switch means being at least ten and being related to the number of alphabetic characters in an alphabet required for production of the information designations;

program switch means which when operative enable the line switches as alphabetical input switches for entry of alphabetical information to the information storage means;

other switch means which when operative enable ten of the line switches as numerical input switches for entry of numerical information to the information storage means; and

telephone dialling means operative in response to selection of an individual information designation to dial the telephone number corresponding to that designation.

4,885,772

APPARATUS FOR OBTAINING A HIGH SOUND LEVEL AND GOOD SOUND REPRODUCTION FROM A LOUDSPEAKING TELEPHONE

Sune M. Gustafsson, Tyresö , Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE87/00024, § 371 Date Oct. 15, 1987, § 102(e) Date Oct. 15, 1987, PCT Pub. No. WO87/05176, PCT Pub. Date Aug. 27, 1987

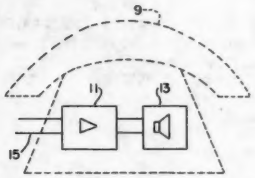
PCT Filed Jan. 22, 1987, Ser. No. 112,839

Claims priority, application Sweden, Feb. 19, 1986, 8600744

Int. Cl.[4] H04M *1/60*

U.S. Cl. 379—390 **4 Claims**

1. A line-powered loudspeaking telephone for obtaining a desired sound level and low distortion sound reproduction comprising a loudspeaker element driven by an amplifying means, characterized in that the loudspeaker element has frequency-dependent efficiency due to its Q value, that the resonance frequency of the loudspeaker element is within the frequency band constituting the speech formant wherein a speech spectrum normally has the greatest amplitude, and in that a gain of the amplifying means is lower for frequencies within a first frequency band containing the resonance frequency of the loud-speaker element than for frequencies within a second, adjacent frequency band containing higher frequencies than said first frequency band, said gain substantially increasing with frequency for frequencies within said first frequency band and remaining substantially constant for frequencies within said second frequency band.



4,885,773

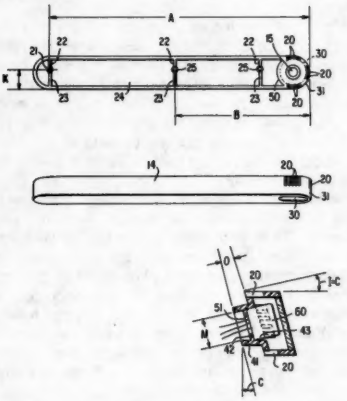
APPARATUS FOR MOUNTING A UNIDIRECTIONAL MICROPHONE IN A HANDS-FREE TELEPHONE SUBSET

William O. Stottlemyer, Corinth, Miss., and Steven J. Woodward, Raleigh, N.C., assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Jan. 9, 1987, Ser. No. 1,781

Int. Cl.[4] H04M *9/08, 1/04*

U.S. Cl. 379—420 **13 Claims**



3. Apparatus for accommodating a unidirectional microphone for use in isolating sound waves from said microphone which sound waves emanate from an additional sound source remote from said microphone and associated with a communication system housing in which a user communicates via said microphone and listens via said additional sound source, comprising:

an elongated shroud member having a U-shaped channel cross-section with a bottom planar member having an extending flange about the outer peripheral edge completely surrounding said bottom planar member;

a microphone housing integrally formed with said shroud member and having an internal hollow for accommodating said microphone and having an extending annular section which extends above said flange and directed at an angle so that when said shroud is positioned with said planar member oriented with respect to the vertical plane said annular section has a main axis parallel to the horizontal plane, with said shroud and housing acting to selec-

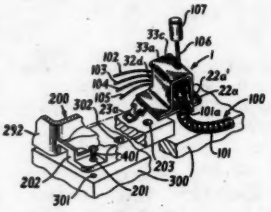
tively dissipate said waves from said additional source, and to enable an accommodated microphone to have its diaphragm parallel to the vertical plane.

4,885,774

BRACKET FOR ARMORED CORD

Rudolph P. Brancati, Richmond Hill, N.Y., assignor to Nynex Corporation, New York, N.Y.

Filed Jul. 22, 1987, Ser. No. 76,384
Int. Cl.[4] H04M *1/15*
U.S. Cl. 379—438 12 Claims



1. A bracket for securing an armored cord to the housing of a telephone, the armored cord comprising a flexible armored sheath having disposed therein a strength member including a flexible cable of first diameter having an end extending beyond the end of the sheath and a termination at the end of the cable of second diameter greater than the first diameter of the flexible cable, the bracket comprising:

a bottom plate including: a central portion having spaced first and second laterally running edges and spaced first and second longitudinally running edges, the central portion further having a slot running laterally from the first longitudinally running edge of the central portion for engaging and securing the sheath of the armored cord; and at least one end portion extending from the central portion, the end portion being adapted to be secured to the telephone housing;

and an inverted U-shaped top plate integral with and overlying the bottom plate so as to define with the central portion of the bottom plate a through opening extending between the first and second longitudinally running edges of the central portion of the bottom plate, the legs of the U-shaped member and the bridge connecting the legs running laterally and the connecting bridge having a first longitudinally running edge closer to the first longitudinally running edge of the central portion of the bottom plate than to the second longitudinally running edge of the central portion of the bottom plate and a second longitudinally running edge closer to the second longitudinally running edge of the central portion of the bottom plate than to the first longitudinally running edge of the central portion of the bottom plate, the connecting bridge further having a slot running laterally from the second longitudinally running edge of the connecting bridge toward the first longitudinally running edge of the connecting bridge and adapted to receive the flexible cable;

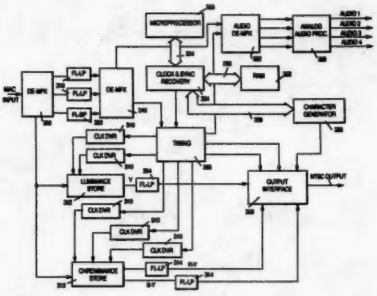
whereby the armored cord is secured to the bracket by inserting the cord within the through opening defined by the U-shaped member and the central portion of the bottom plate from the first longitudinally running edge of the central portion of the bottom plate, the sheath of the cord being bent downwardly to enter and be engaged by the slot in the central portion of the bottom plate and the flexible cable and end termination being pulled until the end termination clears the second longitudinally running edge of the connecting bridge of the U-shaped top plate and is slid thereover so the flexible cable is introduced into the slot in the connecting bridge and the end termination abuts the top surface of the connecting bridge to thereby secure the cable and end termination.

4,885,775

INFORMATION DISPLAY SCHEME FOR SUBSCRIBERS OF A SUBSCRIPTION TELEVISION SYSTEM

Keith Lucas, Oak Ridges, Canada, assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Sep. 21, 1984, Ser. No. 653,061
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[4] H04N *7/167*
U.S. Cl. 380—10 18 Claims



8. In a subscription television system having means for transmitting a scrambled video signal representing television programs to a descrambling decoder and television receiving means for receiving a descrambled signal from the decoder, an information display system for displaying at a receiver subscriber information on said television receiving means, said subscriber information being unique to each subscriber and being integrated with common information generated and communicated in real time from a remote location and said common information being common to a plurality of subscribers of said subscription television system and including a template page, said display system comprising:

template page receiving means coupled to said decoder for receiving said template page as a display format for the subscriber information, wherein said template page includes displayable descriptive information for identifying and describing corresponding portions of said subscriber information;

storage means coupled to said template page receiving means for storing said template page;

logic means coupled to said decoder and to said storage means for generating said subscriber information, said logic means retrieving said template page from said storage means and integrating said subscriber information with said template page for display on said television receiving means, wherein said logic means arranges and positions said descriptive information adjacent to said corresponding portions of said subscriber information.

4,885,776

TELEVISION SIGNAL ENCODER WITH REDUCED TRANSIENT SWITCHING EFFECTS

Richard W. Citta, Oak Park; Michael E. Long, Oak Brook, and Dennis M. Mutzabaugh, Mount Prospect, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

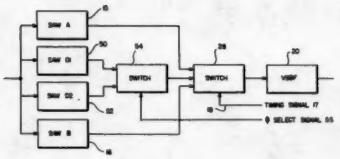
Filed Feb. 24, 1988, Ser. No. 159,813
Int. Cl.[4] H04N *1/44*
U.S. Cl. 380—15 20 Claims

11. A method of encoding a television signal having a video carrier modulated with active video intervals, interspersed

with horizontal intervals and transmitted by a VSBF comprising the steps of:

passing the active video portion of the video carrier through a first filter having a first amplitude and phase characteristic:

passing the horizontal intervals of the video carrier through a second filter having a second amplitude and phase characteristic;



passing the video carrier through a third filter having a third phase and amplitude characteristic between transitions from said active video to said horizontal intervals; and

passing the video carrier through a fourth filter having a fourth amplitude and phase characteristic between transitions from said horizontal to said active video intervals.

4,885,777

ELECTRONIC TRANSACTION SYSTEM

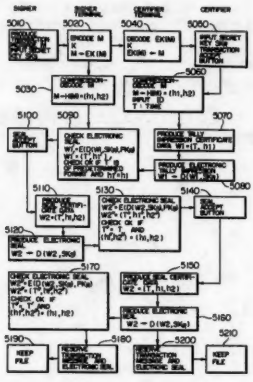
Kazuo Takaragi, Yokohama; Ryoichi Sasaki, Fujisawa; Takayoshi Shiraishi, Chigasaki, and Nobuhiro Kurashiki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 897,861, Aug. 19, 1986, abandoned. This application Apr. 11, 1988, Ser. No. 180,050

Claims priority, application Japan, Sep. 4, 1985, 60-193735; Apr. 28, 1986, 61-96705

Int. Cl.[4] H04K *1/00*

U.S. Cl. 380—30 **4 Claims**



1. An electronic transaction system for electronically sending and receiving digital signatures concerning a transaction message M between a first terminal for a first transacting party and a second terminal for a second transacting party, comprising:

A. in said first terminal:

first means for generating a Hash total h'(M) of the transaction message M derived by compression-encoding said transaction message M and a Hash total h(M) different from said Hash total h'(M);

second means for preparing a digital signature T(A) by encoding data including at least first data containing the Hash total h'(M) and a first certificate not containing the transaction message M by using a secret key of the first transacting party, based on a public key cryptograph system;

third means coupled to the output of said second means for sending the prepared digital signature T(A) from said first terminal to said second terminal;

B. in said second terminal:

fourth means for preparing a digital signature S(B) by encoding data including at least second data containing the Hash total h(M) different from the Hash total h'(M) and a second certificate not containing the transaction message M by using a secret key of the second transacting party, based on said public key cryptograph system;

fifth means coupled to the output of said fourth means for sending the digital signature S(B) from said second terminal to said first terminal; and

C. in said first terminal:

sixth means responsive to reception of the digital signature S(B) from said second terminal for encoding data including at least third data containing the Hash total h(M) and a first certificate not containing the transaction message M by using the secret key of the first transacting party, based on said public key cryptograph system to obtain a digital signature S(A) and for sending the digital signature S(A) from said first terminal to said second terminal.

4,885,778

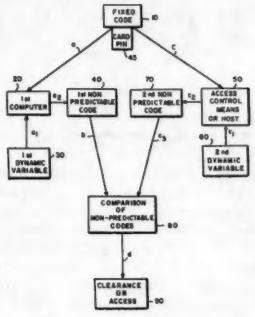
METHOD AND APPARATUS FOR SYNCHRONIZING GENERATION OF SEPARATE, FREE RUNNING, TIME DEPENDENT EQUIPMENT

Kenneth P. Weiss, 15 Dwight St., Boston, Mass. 02109

Continuation-in-part of Ser. No. 676,626, Nov. 30, 1984, Pat. No. 4,720,860. This application Nov. 27, 1985, Ser. No. 802,579

Int. Cl.[4] H04L *9/00*

U.S. Cl. 380—48 **26 Claims**



1. In a system for comparing and matching non-predictable codes generated by separate computers on the basis of dynamic variables defined by separate first and second clock means according to time, an apparatus for effectively synchronizing the first and second clock means comprising:

a first computer for calculating a first non-predictable code according to a predetermined algorithm, the algorithm generating the first non-predictable code on the basis of a first dynamic variable and a unique static variable;

said first clock means automatically defining the first dynamic variable according to a first interval of time in which the static variable is input into the algorithm, the first interval of time having a first predetermined duration;

a second computer for calculating two or more second non-predictable codes according to the predetermined algorithm, the algorithm generating the second non-

predictable codes on the basis of two or more second dynamic variables and the unique static variable;

said second clock means automatically defining the two or more second dynamic variables according to two or more time cells for which the static variable is input into the algorithm of the second computer, the time cells comprising a central cell of time having a predetermined duration and one or more cells of time bordering the central cell of time, each bordering cell of time having a predetermined duration;

means for comparing the first non-predictable code with the second non-predictable codes to determine a match; and

means for automatically synchronizing the first clock means and the second clock means upon comparison and matching of the first non-predictable code with one of the second non-predictable codes.

4,885,779

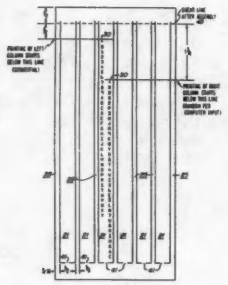
PERSONAL IDENTIFICATION ENCRYPTOR SYSTEM WITH ERROR-CORRECTING CODE AND METHOD

Martin M. Atalla, Atherton, and Alan Roberts, Palo Alto, both of Calif., assignors to Atalla Corporation, San Jose, Calif.

Filed Nov. 2, 1987, Ser. No. 115,210

Int. Cl.[4] H04L *9/04*

U.S. Cl. 380—56 **6 Claims**



1. A data encryption apparatus for operation via a telephone keypad having a set of alphanumeric characters associated therewith comprising:

means compiling the set of alphanumeric characters on the telephone keypad as a first array;

encryption means translating each of the alpha and numeric characters of selected subset pairs of the first array to the same numeric value on the keypad, said encryption means translating the remaining alpha and numeric characters of the first array to numeric values on the keypad and translating the set and subset in a plurality of different ways;

keycode means for identifying each such different translation; and

means assembling the first array on a carrier and assembling a translation of the set and subset as a second array in fixed spatial relationship to the characters in the first array on the carrier; said means designating on said carrier the keycode associated with the translation assembled as the second array on said carrier.

4,885,780

METHOD FOR CALL ROUTING IN A NETWORK

Gita Gopal, Wayne, and Abel Weinrib, Randolph, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Jul. 15, 1988, Ser. No. 219,139

Int. Cl.[4] H04M *7/00*

U.S. Cl. 379—221 **23 Claims**

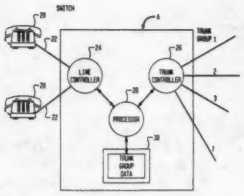
1. A method of setting up a call route between an originating node and a destination node in a network comprising a plurality of nodes, said method comprising:

receiving a request for said call at said originating node,

determining if a preferred route between said originating node and said destination node is immediately available,

if said preferred route for said call is available, seizing said preferred route for said call,

if said preferred route is unavailable, queuing said call for up to a predetermined queuing time,



if said preferred route becomes available for said call within said queuing time, seizing said preferred route for said call, and

if said preferred route does not become available within said queuing time, searching for an alternate, non-preferred route for said call.

wherein said preferred route is a direct route between said originating and destination nodes and said alternate non-preferred route is a non-direct, multi-hop route.

4,885,781

FREQUENCY-SELECTIVE SOUND TRANSDUCER

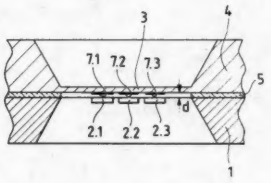
Helmut Seidel, Starnberg, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,417

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731196

Int. Cl.[4] H04R *1/28, 17/00, 17/10;* **H01L** *41/08*

U.S. Cl. 381—159 **10 Claims**



1. A frequency-selective sound transducer comprising:

a plurality of resonators arranged in a first plane, the resonators vibrating when influenced by sound waves having the same frequency as the natural frequency of the resonators, the vibrating motion of the resonators being converted into electrical signals; and

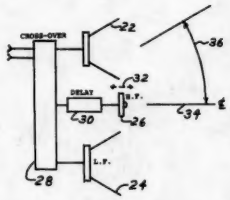
membrane means arranged in a second plane, the second plane being parallel to the first plane and in close proximity thereto, a small air gap being formed thereby between the membrane and resonators, the membrane being capable of vibratory motion when struck by sound waves, the vibratory motion of the membrane causing vibratory motion in the air in the air gap and, in turn, vibratory motion in the resonators.

4,885,782

SINGLE AND DOUBLE SYMMETRIC LOUDSPEAKER DRIVER CONFIGURATIONS

Steven J. Eberbach, Ann Arbor, Mich., assignor to Howard Krausse, Ann Arbor, Mich.

Filed May 29, 1987, Ser. No. 55,786
Int. Cl.[4] H04R *1/26*
U.S. Cl. 381—186 10 Claims



1. A loudspeaker comprising a high frequency driver and a plurality of relatively lower frequency drivers, said lower frequency drivers positioned symmetrically in pairs in at least one dimension about the high frequency driver,

and a combination of electric means and geometric means to together cause delay of the acoustic waves emanating from the high frequency driver relative to the lower frequency drivers,

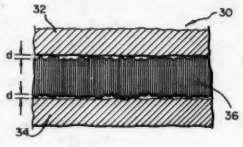
wherein the lower frequency drivers comprise a plurality of driver pairs positioned above and below and to either side of the high frequency driver in a symmetric arrangement about the high frequency driver.

4,885,783

ELASTOMER MEMBRANE ENHANCED ELECTROSTATIC TRANSDUCER

Lorne A. Whitehead, Vancouver, Canada; Robert L. Clark, Pleasanton, Calif., and Francis L. Curzon, Vancouver, Canada, assignors to The University of British Columbia, Vancouver, Canada

Filed Apr. 10, 1987, Ser. No. 37,265
Claims priority, application Canada, Apr. 11, 1986, 506496
Int. Cl.[4] H04R *19/00*
U.S. Cl. 381—191 12 Claims



1. A transducer, comprising:

(a) opposed first and second conductive plates for application of an electrical potential therebetween; and,

(b) an elastomeric dielectric material disposed between said plates and in contact therewith;

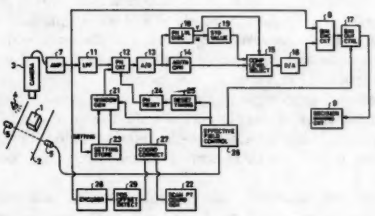
said dielectric material having a plurality of pockets of approximate average depth "d" such that, for a gas existing within said pockets at a pressure "P", the product Pd is significantly less than the value required to achieve the minimum breakdown voltage of said gas.

4,885,784

SYSTEM FOR BINARY ENCODING A PICTURE

Michiaki Miyagawa; Koichi Oki, and Hiroyuki Horii, all of Kanagawa, Japan, assignors to Fuji Electric Company Ltd., Kanagawa, Japan

Continuation of Ser. No. 884,074, Jul. 10, 1986, abandoned. This application Apr. 22, 1988, Ser. No. 186,698
Claims priority, application Japan, Jul. 10, 1985, 60-150024; Jul. 10, 1985, 60-150025
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—8 13 Claims



1. A method for encoding a video image of a plurality of objects comprising the steps of:

transporting said objects past a video imaging device;

locating a predetermined window at the same relative position of each of said objects,

forming a preliminary video signal from said predetermined window of said video image of each said object using said video imaging device;

forming a desired video signal for each of said objects using said video imaging device from a complete video image of each said object;

analyzing said preliminary video signal to extract density information;

setting, for each of said objects, a threshold for binary encoding using said extracted density information from said preliminary video information; and

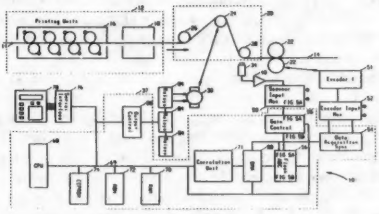
comparing said desired video signal for each of said objects with said threshold for that object to form a binary video signal representing that object.

4,885,785

CUTOFF CONTROL SYSTEM

Bruce A. Reynolds, Sussex, and Alexander Brengauz, Whitefish Bay, both of Wis., assignors to Quad/Tech, Inc., Pewaukee, Wis.

Continuation-in-part of Ser. No. 925,329, Oct. 31, 1986. This application Oct. 30, 1987, Ser. No. 115,939
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—8 33 Claims



1. A system for relating a cyclical machine operation to the position of images on a moving web comprising:

position adjustment means, responsive to control signals

applied thereto, for controllably varying the effective position of said machine operation along said moving web;

means for generating image signals indicative of the image on said web;

means for sampling said image signals at respective sampling intervals during the machine cycle;

means for selectively generating, from image signal samples of a first machine cycle, reference pattern indicia;

means for selectively generating, from image signal samples of a successive machine cycle, new pattern indicia;

a pipelined sum-of-products generator;

means for selectively applying said reference pattern indicia and said new pattern indicia to said sum-of-products generator, to generate respective correlation coefficients between said reference pattern and a plurality of shifted versions of said new pattern indicia;

means for processing said correlation coefficients to determine which of said plurality of shifted versions of said new pattern indicia produced the largest correlation coefficient and generating an indicating signal in response thereto; and

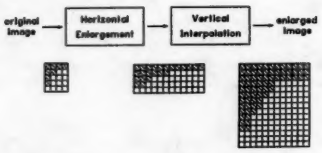
means for generating said control signals to said position adjustment means in accordance with said indicating signal.

4,885,786

METHOD FOR ENLARGING AN IMAGE STORED IN RUN REPRESENTATION FORM

Karen L. Anderson, Peekskill; William B. Pennebaker, Carmel, and Keith S. Pennington, Somers, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 664,263, Oct. 24, 1984, abandoned.
This application May 24, 1988, Ser. No. 198,666
Int. Cl.[4] G06K *9/42*
U.S. Cl. 382—47 **21 Claims**



1. A method for enlarging a binary digital image along first and second axes thereof by factors of F1 and F2, respectively, said binary image having rows of picture elements or pels, said rows arranged adjacently along said second axis and containing runs of white and black pels, comprising the steps of:

storing the rows of said image as a plurality of run ends with each row being represented as a sequence of values corresponding to the unnormalized white and black run ends;

partially enlarging said binary image along said first axis by altering the value of each unnormalized run end in the respective rows by a predetermined factor F1;

further enlarging said binary image along said second axis by creating additional rows interpolated between the rows of the partially enlarged image produced by the preceding step, using the corresponding run ends of the rows of the partially enlarged image adjacent the additional interpolated rows to determine the positions of the white and black run ends on the interpolated rows, the number and distribution of said interpolated rows being chosen so as to produce enlargement along said second axis by a predetermined factor F2; and

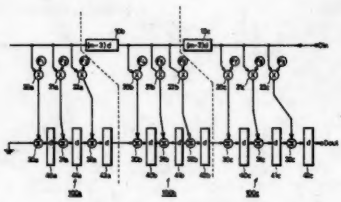
storing said enlarged size image generated by the above steps in said unnormalized run end form.

4,885,787

HIGH-SPEED DIGITAL IMAGE PROCESSING APPARATUS

Kenji Okamoto, and Yasushi Kida, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 19, 1988, Ser. No. 157,709
Claims priority, application Japan, Feb. 20, 1987, 62-38765
Int. Cl.[4] G06K *9/40*
U.S. Cl. 382—54 **3 Claims**

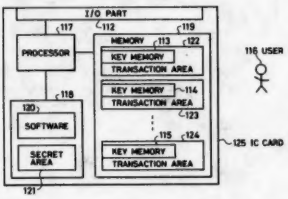


1. A filter circuit for digitally processing video image information of an object to be measured in real time, said video image information being included in an image plane constituted by pixels arranged in a matrix of m-rows and n-columns m and n each being a natural number, based on a pattern of predetermined constants of p-rows and q-columns p and q each being natural numbers, respectively satisfying the condition of $p<m$ and $q<n$, comprising: time sequenntial output means for time sequentially extracting and outputting pixel data from said image plane; and cascaded filter circuit means connected to said sequential output means for filtering said pixel data, said cascaded filter circuit means comprising a number p of basic filter circuits (100*a*, 100*b*, 100c) connected with each other in cascade fashion to form said cascaded filter circuit means, each of said basic filter circuits carrying out an extraction based on said pattern of predetermined constants for the pixel data of one row and q-columns, each of said basic filter circuits comprising first delay means (10) for applying received pixel data to the basic filter circuit of the succeeding stage with a delay of a time corresponding to one row of said image, a number of q-multipliers (20, 21, 22) directly connected in parallel with each other, each multiplier multiplying the received pixel data with a corresponding constannt of said pattern of constants for outputting, and a number of q-sets of adders (30, 31, 32) adn second delay means (40, 41, 42) receiving the output of said adders provided corresponding to each of said multipliers, wherein said q-sets of adders are connected in series with each other, each of said q-adders summing the corresponding multiplier output and the output of the respective basic filter circuit in the preceding stage for outputting the sum to the second delay means in the same set whereby said second delay means receives an output of the adder in the same set and applies a delayed output to the adder in the succeeding set with a delay time corresponding to one column of said image, said filter circuit further comprising means (81) for generating a head indicating bit (I_{clcp}) indicating the initial bit position of one row of the pixel data from said time sequential output means, and third delay means (50*f* to 50*l*, 50*m*, SW) connected to receive said head indicating bit from said head indictating bit generation means, said third delay means delaying said head indicating bit for a time duration correspondign to a delay time applied to said pixel data.

4,885,788
IC CARD

Kazuo Takaragi, Yokohama; Takayoshi Shiraishi, Chigasaki, and Ryoichi Sasaki, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 12, 1987, Ser. No. 13,800
Claims priority, application Japan, Feb. 17, 1986, 61-30815
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—23 **4 Claims**



1. In an integrated circuit card having a memory with a plurality of transaction memory areas, each adapted for storing data related to an associated data source, and a like plurality of authorization memory areas, one authorization memory area uniquely associated with each transaction memory area; input-/output means for receiving data from and transmitting data to a data source; and processor means for exchanging data with said input/output means and with said memory and for processing data; the improvement wherein said processor means includes:

input means for receiving data from a data source;

acquiring means responsive to input from the data source of an enabling code unique to that data source for acquiring an encrypted code from the one of said authorization memory areas associated with the transaction memory area that is associated with that data source;

means for calculating an authorization code from data stored in said associated transaction memory area;

means for comparing the acquired encrypted code with the calculated authorization code;

means responsive to a proper comparison for permitting receipt of transaction data from the data source; and

means responsive to receipt of transaction data from the data source for writing of transaction data into said associated transaction memory area to update data stored therein and for updating the encrypted code in said authorization memory area,

thereby preventing access to said associated transaction memory area if the data therein has been altered without authorization.

4,885,789
REMOTE TRUSTED PATH MECHANISM FOR TELNET

Wilhelm F. Burger, Bethesda; Mark E. Carson, Rockville; Abhai Johri, Gaithersburg, all of Md., and Ellen J. Stokes, Liberty Hill, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1988, Ser. No. 150,966
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—25 **2 Claims**

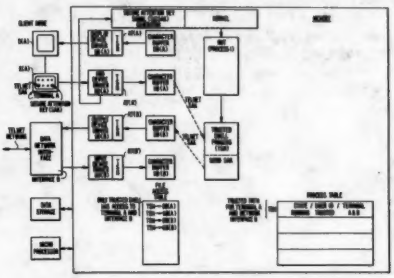
1. A method in a computer operating system for creating, in response to a network secure attention request, a trusted path between a communications network connected to a data processor running a trusted control process under said operating system and a trusted user program portion of a trusted computing base in said data processor, comprising the steps of:

waiting for the receipt of a network Secure Attention Key message from said communications network;

outputting in response to the receipt of said network Secure Attention Key message, a Secure Attention Key signal;

terminating active processes under a trusted parent control process in response to said production of said Secure Attention Key signal;

limiting the access of processes in said data processor to said communications network to only said control process;



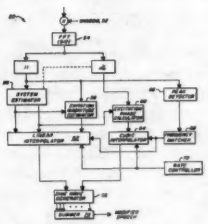
establishing a trusted user program process under said control process, having exclusive access to said communications network;

whereby a trusted path is established between said communications network and said trusted user program process.

4,885,790
PROCESSING OF ACOUSTIC WAVEFORMS

Robert J. McAulay, Lexington, and Thomas F. Quatieri, Jr., Newton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 712,866, Mar. 18, 1985, abandoned.
This application Apr. 18, 1989, Ser. No. 339,957
Int. Cl.[4] G10L *3/00, 5/00*
U.S. Cl. 381—36 **64 Claims**



1. A method of processing an acoustic waveform, the method comprising:

sampling the waveform to obtain a series of discrete samples and constructing therefrom a series of frames, each frame spanning a plurality of samples;

analyzing each frame of samples to extract a set of variable frequency components having individual amplitudes;

matching said variable components from one frame to a next frame such that a component in one frame is matched with a component in a successive frame that has a similar value regarless of shifts in frequency and spectral energy; and

interpolating the matched values of the components from the one frame to the next frame to obtain a parametric representation of the waveform whereby a synthetic waveform can be constructed by generating a set of sine waves corresponding to the interpolated values of the parametric representation.

4,885,791

APPARATUS FOR SPEECH RECOGNITION

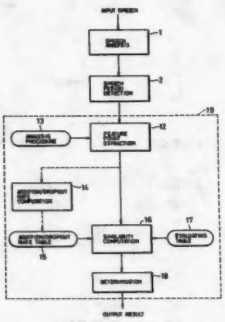
Satoru Fujii; Katsuyuki Niyada, both of Sagamihara; Shuji Morii, Tokyo, and Taisuke Watanabe, Sagamihara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 20, 1986, Ser. No. 920,785

Claims priority, application Japan, Oct. 18, 1985, 60-233644; Nov. 20, 1985, 60-260052; Dec. 5, 1985, 60-273741

Int. Cl.[4] G10L *1/00*

U.S. Cl. 381—43 11 Claims



1. A speech recognition apparatus comprising:

(a) a speech analysis portion for extracting parameters necessary for determining of spoken words;

(b) a speech period detecting portion for extracting one or more combinations of speech periods using said parameters; and

(c) a structure analysis portion responsive to said speech analysis portion and said speech period detecting portion for detecting feature points indicative of phoneme structure of each word using said parameters found within said detected speech periods and for determining a word through computation of similarity to predetermined proposed words in accordance with the presence and absence of the feature points, said structure analysis portion comprising:

(i) an analysis procedure portion for indicating the procedure of automatically detecting feature points representative of phoneme structure for each word;

(ii) an addition/dropout rate table made by obtaining an addition/dropout rate of said feature points from a number of samples;

(iii) an evaluating table in which types of predetermined feature points necessary for determining a word are written for each of a plurality of predetermined words;

(iv) a feature point extracting portion for extracting feature points from input speech in accordance with the contents of said analysis procedure portion;

(v) a similarity computing portion for computing similarity of feature points necessary between objective words by detecting the presence/absence of feature points with reference to said evaluating table and said addition/dropout rate table; and

(vi) a determining portion for determining words by using said similarity.

4,885,792

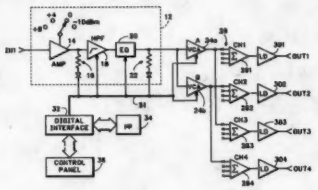
AUDIO MIXER ARCHITECTURE USING VIRTUAL GAIN CONTROL AND SWITCHING

Donald R. Christensen, Grass Valley; Robert Bateman, Nevada City, and Thomas A. Grancey, Grass Valley, all of Calif., assignors to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Oct. 27, 1988, Ser. No. 263,148

Int. Cl.[4] H04B *1/00*

U.S. Cl. 381—119 6 Claims



1. An audio mixer architecture comprising:

means for receiving a plurality of audio input signals to produce a corresponding plurality of processed audio input signals;

means for individually controlling, in response to a respective gain control signal, the gain of each processed audio input signal to produce a plurality of attenuated audio input signals;

means for combining the attenuated audio input signals into a plurality of audio output signals; and

means for providing an overall attenuation for each audio output signal by synthesizing a master gain control signal for each audio output signal and an individual gain control signal for each processed audio input signal that are combined to produce each respective gain control signal.

4,885,793

DIGITAL SERVO SYSTEM USING MICROCOMPUTER FOR CONTROLLING PHASE AND SPEED OF ROTARY BODY

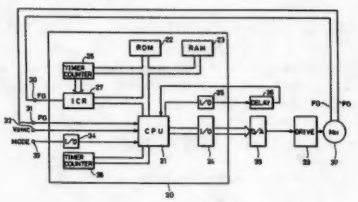
Junichiro Tabuchi, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Feb. 8, 1988, Ser. No. 153,060

Claims priority, application Japan, Feb. 10, 1987, 62-29103; Feb. 16, 1987, 62-32813; Feb. 24, 1987, 62-42275; Feb. 24, 1987, 62-42276; Feb. 27, 1987, 62-45869; Mar. 6, 1987, 62-52587

Int. Cl.[4] G05B *5/00*

U.S. Cl. 388—810 31 Claims



1. A digital servo system comprising:

a rotary body;

means for driving rotation of said rotary body,

means for supplying a detection signal associated with rotational speed and/or rotational phase of said rotary body,

digital circuit means comprising:

means responsive to said detection signal for generating a

digital phase error signal associated with the rotational phase and having a first conversion gain,

means responsive to said detection signal for generating a digital speed error signal associated with the rotational speed of said rotary body and having a second conversion gain,

means for digitally adding said digital phase error signal and said digital speed error signal to each other to generate a digital error signal,

means for digitally amplifying said generated digital error signal to form an amplified digital error signal,

means for applying said amplified digital error signal to said rotation driving means, and

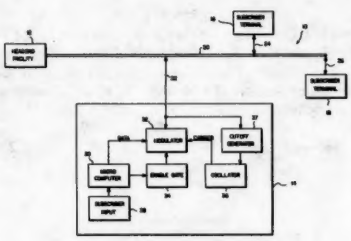
wherein the first and second conversion gains are both sufficiently low such that the servo system possesses relatively large pre-defined capture ranges correspondingly associated with the digital phase error signal and the digital speed error signal.

4,885,794

METHOD AND APPARATUS FOR PROTECTION OF CHANNEL ACCESS IN BROADBAND CABLE COMMUNICATIONS SYSTEMS

Gary J. Sgrignoli, Mt. Prospect, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 23, 1987, Ser. No. 41,818
Int. Cl.[4] H04H *1/02*
U.S. Cl. 455—5 **17 Claims**



1. In a transceiver coupled to transmit signals onto a cable television system cable plant or broadband cable communications network, the improvement comprising:

a modulator for generating a transmission signal in response to an enabling signal and carrier wave;

means responsive to said enabling signal effective to transmit said enabling signal to said modulator for a continuous period on longer than a first predetermined maximum time period;

means for providing said carrier wave to said modulator; and

carrier wave cut-off means responsive to said modulator and coupled to said carrier wave providing means for preventing said carrier wave from being supplied to said modulator if and when said transmission signal has been generated for a continuous period equal to a second predetermined maximum time period.

4,885,795

HOSPITAL DIGITAL DATA TRANSFER SYSTEM

Earl L. Bunting, Westport, and Michael Kovis, Fairfield, both of Conn., assignors to Bunting, Inc., Bridgeport, Conn.

Filed Nov. 6, 1987, Ser. No. 118,211
Int. Cl.[4] H04H *1/02*; H04L *25/40*
U.S. Cl. 455—5 **21 Claims**

1. A digital data transfer system comprising:

(a) a DC voltage source;

(b) a load;

(c) a direct current path between the DC voltage source and the load comprising:

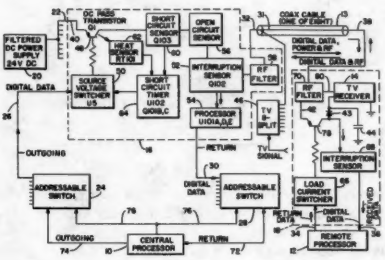
(i) a coaxial cable having a central conductor which includes first and second ends;

(ii) a first end conductive path for connecting the DC voltage source to the first end of the central conductor; and

(iii) a second end conductive path for connecting the load to the second end of the central conductor;

(d) first end switch means in the first end conductive path having an open state in which the flow of DC current from the DC voltage source to the load is interrupted and a closed state in which the flow of DC current is uninterrupted;

(e) first end bit receiving means for receiving a digital bit from a first source of such bits external to the digital data transfer system and for switching the first end switch means into its open state for a period of time corresponding to the duration of the bit;



(f) second end switch means in the second end conductive path having an open state in which the flow of DC current from the DC voltage source to the load is interrupted and a closed state in which the flow of DC current is uninterrupted;

(g) second end bit receiving means for receiving a digital bit from a second source of such bits external to the digital data transfer system and for switching the second end switch means into its open state for a period of time corresponding to the duration of the bit;

(h) first end bit generating means for sensing an interruption in the flow of DC current through the first end conductive path produced by the second end switch means and generating a digital bit in response thereto; and

(i) second end bit generating means for sensing an interruption in the flow of DC current through the second end conductive path produced by the first end switch means and generating a digital bit in response thereto.

4,885,796

COMMUNICATION APPARATUS FOR USE IN HAZARDOUS ENVIRONMENTS

Daniel L. Loftus, 771 Washington Ave., Bourbannais, Ill. 60914, and David L. Shelley, 27 Duncan Dr., Bourbannais, Ill. 60914

Filed Apr. 19, 1985, Ser. No. 725,328
Int. Cl.[4] H04B *7/15, 1/38*
U.S. Cl. 455—11 **8 Claims**

1. Communication apparatus for use in a hazardous environment such as one characterized by the presence of smoke and/or noxious gas, said apparatus comprising:

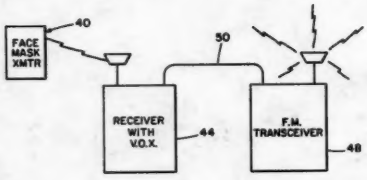
a standard-issue firefighter's face mask covering the eyes, nose and mouth of the user, said mask including a frame holding a transparent viewing shield and further including a peripheral resilient seal on said frame bearing against the face of the user to seal against the entrance of said smoke and gas to the respiratory system of the user,

a standard-issue firefighter's helmet, said helmet being entirely separate from said face mask,

a standard-issue firefighter's air supply including a tube connected to said mask for providing breathable air to the user through said mask, said mask further including an air inlet opening positioned adjacent to the mouth of the user,

a relatively low power transmitter positioned entirely inside said mask adjacent said air inlet for transmitting a short range signal carrying a communication from the user, said transmitter including a microphone and an enclosure holding said microphone and other components of said transmitter,

a relatively high powered standard-issue firefighter's transceiver carried on the person of the user, said transceiver being responsive to the operation of switch means to shift from a receiving mode to a transmitting mode, said transceiver transmitting on a different frequency than the frequency on which said low power transmitter transmits;



a receiver carried on the person of the user tuned to receive the signal of said low power transmitter and providing an audio output;

a voice activated switch means also carried on the person of the user and which is responsive to said receiver providing said audio output for providing a switching output to switch said transceiver from said receiving mode to said transmitting mode; and

means interconnecting said switch means and said transceiver for providing said audio output and said switching output to said transceiver whereby the user is enabled to communicate with remote receivers tuned to the transmitting frequency of said transceiver without compromising the integrity of the face mask as by running wires through the viewing shield or interrupting the seal due to passage of wires between the seal and the face of the user.

4,885,797

COMMUNICATION SYSTEM

Terence H. Leather; Frank R. Naylor, both of Blackpool, and Paul S. Gradwell, Chorley, all of United Kingdom, assignors to Terence H. Leather, Blackpool, England

PCT No. PCT/GB86/00762, § 371 Date Jun. 2, 1988, § 102(e) Date Jun. 2, 1988, PCT Pub. No. WO87/03501, PCT Pub. Date Jun. 18, 1987

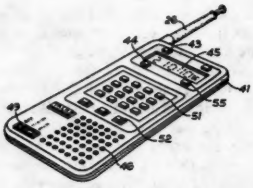
PCT Filed Dec. 15, 1986, Ser. No. 199,277

Claims priority, application United Kingdom, Dec. 13, 1985, 8530772

Int. Cl.[4] H04B *1/34*

U.S. Cl. 455—40 **3 Claims**

1. A communication system for instructing individual members of a group and the group as a whole comprising a transmitter to be used by the instructor and a receiver for each memeber of the group which receiver contains an electric battery and is mounted on an elastically extensible article to be worn on the head of the respective member, each receiver designed to be extensible and to be contained within the extensible article, an input amplifier stabilized by a crystal oscillator and yielding an audio frequency signal, decoding means for sensing a sub-audible tone in that signal identifying that the signal is intended for the entire group or another sub-audible tone identifying that the signal is intended for the particular receiver, an output circuit for passing the signal to audio transducers, one over each ear of the member in use, when the decoding means yields a signal denoting that a sub-audible tone acceptable to that receiver is contained in the audio frequency



signal, and in that the transmitter injects a sub-audible continuous tone under the control of the instructer to identify the member to be instructed onto the audio input to the receiver.

4,885,798

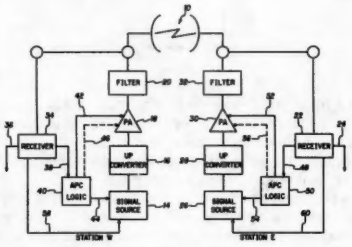
POWER CONSUMPTION CONTROL APPARATUS

Leon Jinich, and Karl R. Varian, both of Plano, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 7,854, Jan. 28, 1987, abandoned. This application Sep. 14, 1988, Ser. No. 246,023

Int. Cl.[4] H04B *7/02, 15/00*

U.S. Cl. 455—52 **2 Claims**



1. The method of decreasing the power consumption of a transmitter-receiver radio communication system having a supervisory channel comprising the steps of:

reducing the bias level of at least one of the output amplifier stages in the transmitter portion below the optimum linearity design value whereby distorted signals are transmitted at given reduced power levels under normal conditions;

detecting the power level of received signals at the receiver poerion of the communication system;

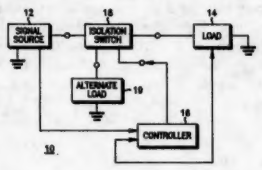
returning a supervisory request for additional power from the receiver portion to the transmitter portion of the system when the power level of the received signal falls below a predetermined value; and

dynamically increasing the bias level of said at least one output amplifier stages whereby signals are transmitted above said given power levels, in accordance with and upon receipt of said request for additional power.

4,885,799
LOAD PULL ISOLATION SWITCH FOR A FAST LOCKING SYNTHESIZER

Mark I. Van Horn, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1987, Ser. No. 69,796
Int. Cl.[4] H04B *1/44;* H01P *1/10;* H03G *9/00*
U.S. Cl. 455—78 10 Claims



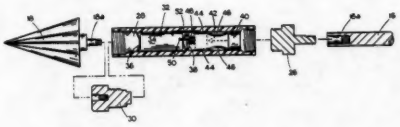
2. A mobile radio transceiver including a signal source such as a programmable multi-frequency synthesizer having a variable frequency and coupled by a first lead ("lead A") to an isolation switch having means for switching said signal source between a fixed termination impedance load coupled to said isolation switch by a second lead ("lead B") and a variable impedance load having at least two impedance states and that is variable about a desired (proper) impedance value coupled to said isolation switch by a third lead ("lead C"), said signal source, said variable impedance load, and said isolation switch responsive to a controller, said controller coupled to said isolation switch by a fourth lead ("lead D"),

said controller having means for sensing when said variable impedance load has changed between two impedance states and has reached an impedance value very nearly equal to its proper impedance value as well as sensing when the frequency of said signal source has settled to its proper frequency value before activating switchover via said isolation switch from said fixed termination impedance load connected via said lead B to said variable impedance load connected via said lead C.

4,885,800
TRANSMITTER ATTACHMENT FOR HUNTING ARROWS

Clyde M. Ragle, 9251 Spalding, Omaha, Nebr. 68134

Filed May 25, 1989, Ser. No. 357,428
Int. Cl.[4] H04B *1/034;* A63B *65/02*
U.S. Cl. 455—98 5 Claims



1. A transmitter attachment for a hunting arrow, the arrow of the type having a shaft and removable arrowhead, comprising:

a hollow tubular member having a first and second ends; said first ends having means for removable connection to an arrowhead;

said second end having means for removable connection to an arrow shaft;

transmitting means mounted within said tubular member for emitting a radio frequency signal;

a battery journaled within said tubular member for powering said transmitting means;

inertia-activation switch means operably mounted within said tubular member electrically connected between said battery and said transmitting means and operable between first and second positions, said first position electrically connecting said battery and transmitting means to operate the same, and said second position electrically disconnecting said battery and transmitting means;

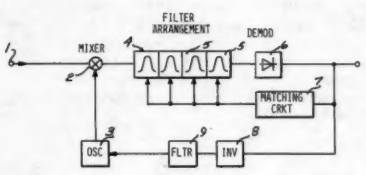
said inertia-activation switch being operably mounted such that a dynamic force of predetermined magnitude directed longitudinally in a first direction along said hollow tubular member will move said switch to said first position, and a dynamic force of predetermined magnitude directed longitudinally in a second direction along said hollow tubular member will move said switch to said second position; and

said inertia-activation switch being adapted to remain in either said first or said second positions in the absence of said dynamic forces.

4,885,801
METHOD AND CIRCUIT FOR CONVERTING FREQUENCY-MODULATED SIGNALS THROUGH AT LEAST ONE INTERMEDIATE FREQUENCY INTO LOW FREQUENCY SIGNALS

Jens Hansen, Berlin, Fed. Rep. of Germany, assignor to H.U.C. Elektronik Hansen & Co., Fed. Rep. of Germany

PCT No. PCT/DE87/00068, § 371 Date Sep. 23, 1987, § 102(e) Date Sep. 23, 1987, PCT Pub. No. WO87/05170, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 23, 1987, Ser. No. 116,567
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1986, 3606250
Int. Cl.[4] H04B *1/10*
U.S. Cl. 455—264 5 Claims



1. A method for converting frequency-modulated signals through at least one intermediate frequency into low frequency signals comprising the steps of:

receiving frequency-modulated signals;

mixing the received frequency-modulated signals with a frequency provided by an oscillator to generate intermediate frequency signals;

filtering the intermediate frequency signals in a filter having a resonant frequency;

demodulating the filtered intermediate frequency signals to generate low frequency signals;

deriving a control voltage from the low frequency signals;

controlling the resonant frequency of the filter by a filter control signal in accordance with the frequency shift of the intermediate frequency signals by means of the control voltage derived from the demodulated low frequency signals; and

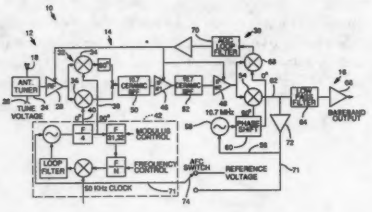
controlling the oscillator control voltage by phase rotating the low frequency signals by 180° to make the resonant frequency of the filter follow changes in the frequency of the intermediate frequency signals so as to decrease the deflection in the high frequency range of the low frequency signals.

4,885,802

WRISTWATCH RECEIVER ARCHITECTURE

Lawrence H. Ragan, Richardson, Tex., assignor to AT&E Corporation, San Francisco, Calif.

Filed Jun. 30, 1988, Ser. No. 213,719
Int. Cl.[4] H04B *1/06*
U.S. Cl. 455—344 **9 Claims**



1. A wristwatch FM subcarrier receiver comprising:

RF amplifier means for amplifying RF signals;

local oscillator means including a phased lock loop for providing a local oscillator signal;

image cancelling mixer means coupled to the RF amplifier means and the local oscillator means for mixing the RF signals and the local oscillator signal to produce an IF signal;

gain controlled IF amplifier means coupled to the image cancelling mixer means for amplifying the intermediate frequency signal;

synchronous automatic gain control means coupled to the IF amplifier means for controlling the gain of said amplifier means in response to the magnitude of its output signal;

synchronous detector means coupled to the IF amplifier means and including a phased lock loop for producing a voltage signal having an instantaneous value related to an instantaneous frequency of the IF signal;

baseband amplifier means coupled to the detector means for amplifying the voltage signal produced thereby;

enclosure means for enclosing all of the aforesaid means and adapted to be strapped to a user's wrist; and

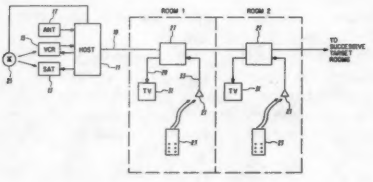
antenna means for providing RF signals to the RF amplifier means.

4,885,803

SYSTEM AND METHOD FOR CONTROLLING A PLURALITY OF ELECTRONIC ENTERTAINMENT DEVICES

Lawrence W. Hermann, 1922 Old Orchard, Dallas, Tex. 75208, and Donald G. Offield, Addison, Tex., assignors to Lawrence W. Hermann, Dallas, Tex.

Filed Mar. 17, 1987, Ser. No. 26,460
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—603 **7 Claims**



1. A system for controlling the operation of a plurality of electronic devices from a plurality of remote areas, each of said remote areas having a signal receiver, at least one of said electronic devices having a light energy receiver ordinarily cooperable with a corresponding portable light energy transmitter for controlling the operation of the corresponding device, said corresponding transmitter when in said remote area being beyond the range of the corresponding receiver, said system comprising:

electrical conductor means for electrically coupling said electronic devices to said signal receivers;

light energy detector means positioned at each of said remote areas for detecting respective light energy control signals generated by a corresponding transmitter and for converting said light energy control signals into corresponding electrical control signals, said detector means being coupled to said conductor means for transmitting said control signals in both directions along said conductor means; and

control means electrically coupled in series between each of said detector means and said electronic devices for receiving said electrical control signals from each of said detector means, said control means being electrically coupled to said electronic devices for receiving respective electrical signals therefrom, said control means having:

means for combining the respective electrical signals from said electronic devices into corresponding mixed electrical signals at a relatively constant impedance and for transmitting said mixed electrical signals to said signal receivers,

means for converting the electrical control signals from each of said detector means into corresponding light energy control signals and for transmitting the corresponding light energy signals to control the corresponding electronic devices, and

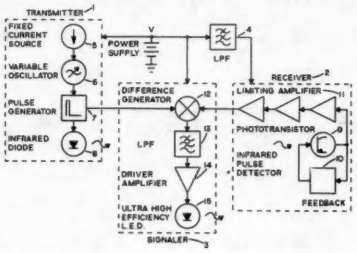
means for generating a predetermined DC electrical signal and for transmitting said DC electrical signal to each remote area to provide operating power for the detector means at each remote area.

4,885,804

OPTICAL TRANSMITTING AND RECEIVING APPARATUS

Eugene E. Mayle, 319 Kammer Ave., Dayton, Ohio 45417

Filed May 9, 1988, Ser. No. 191,546
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—606 **9 Claims**



1. An optical transmitting and receiving apparatus comprising:

variable oscillator means capable of producing a periodic electrical signal at various selectable frequencies each of which representing a known message among users of the device;

selection means allowing a user to select one of said frequencies and therefore a message to communicate;

stability means capable of minimizing frequency changes in said oscillator due to voltage supply variations;

means responsive to said oscillator and capable of generating electrical pulses at the user selected oscillator frequency;

means responsive to said oscillator and capable of generating optical pulses at the user selected oscillator frequency for transmission to a second device;

detection means capable of converting optical pulses transmitted from a second device into electrical pulses;

conditioning means capable of bandpassing and amplifying the detected electrical pulses into a high level received signal;

means capable of producing a difference signal which frequency is the absolute difference of said received signal and the user selected oscillator frequency and which amplitude decreases as said frequency difference increases;

means responsive to said difference signal and capable of alerting the user to the production of the same.

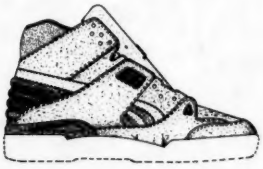
DESIGNS

DECEMBER 5, 1989

304,875
BABY BIB
Mark W. Benson, 213 Earl St., St. Paul, Minn. 55106
Filed Sep. 2, 1988, Ser. No. 239,856
Term of patent 14 years
U.S. Cl. D2—226

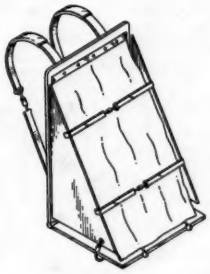
304,876
SHOE UPPER
Paul D. Brown, Hingham, and Juan A. Diaz, Weymouth, both of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Feb. 8, 1989, Ser. No. 307,573
Term of patent 14 years
U.S. Cl. D2—314

304,877
SHOE UPPER
David E. Miller, Carver, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Feb. 8, 1989, Ser. No. 307,576
Term of patent 14 years
U.S. Cl. D2—314

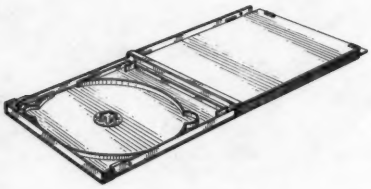


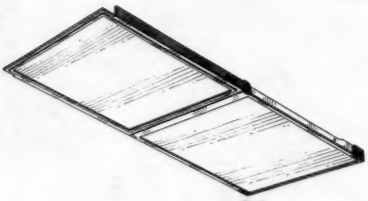
304,878
WATERTIGHT ACCESSORY CONTAINER
Björn O. H. Persson, Angantyrvägen 27 C, S-182 64 Djursholm, Sweden
Filed Feb. 4, 1986, Ser. No. 825,916
Term of patent 14 years
U.S. Cl. D3—30.1

304,879
BACKPACK GROCERY CARRIER
Lloyd Mitchell, 211 E. 83rd St., Chicago, Ill. 60619
Filed Feb. 18, 1986, Ser. No. 834,052
Term of patent 14 years
U.S. Cl. D3—32



304,880
STORAGE UNIT
Isidore Philosophe, Willowdale, Canada, assignor to Cinram Ltd./Ltee., Scarborough, Canada
Filed Mar. 3, 1986, Ser. No. 840,707
Claims priority, application Canada, Jan. 7, 1986, 07-01-86-2
Term of patent 14 years
U.S. Cl. D3—35

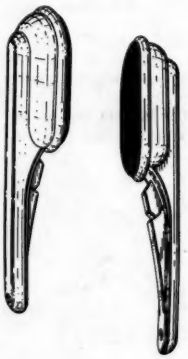




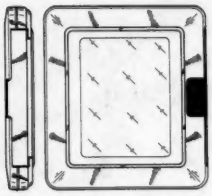
304,881
COMBINED CARRYING BAG AND RADIO
Benson Zinbarg, and Nancy Mimoun, both of Stamford, Conn., assignors to Sun Hill Industries, Inc., Stamford, Conn.
Filed Jul. 10, 1987, Ser. No. 72,233
Term of patent 14 years
U.S. Cl. D3—43

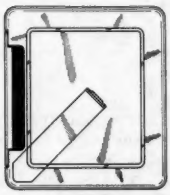
304,882
SHOULDER BAG STRAP
Yoshi Kawaguchi, 16-11, Higashi-Nihonbashi 2-Chome, Chuo-ku, Tokyo, Japan
Filed Aug. 4, 1986, Ser. No. 893,500
Term of patent 14 years
U.S. Cl. D3—54

304,883
BRUSH FOR CLEANING CLOTHING AND OTHER TEXTILES
Max C. F. Fan, Kowloon, Hong Kong, assignor to Chan Cheong Ping; Chan Cheong Wan and Chan Haykwan, all of Chaiwan, Hong Kong
Filed May 12, 1987, Ser. No. 49,202
Claims priority, application United Kingdom, Nov. 14, 1986, 1038081
Term of patent 14 years
U.S. Cl. D4—137



304,884
PICTURE VIEWER
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland
Continuation-in-part of Ser. No. 17,797, Feb. 24, 1987, which is a continuation-in-part of Ser. No. 933,179, Nov. 21, 1986. This application Apr. 9, 1987, Ser. No. 36,841
Claims priority, application World Int. Prop. O., Oct. 10, 1986, DM/007616
Term of patent 14 years
U.S. Cl. D6—311

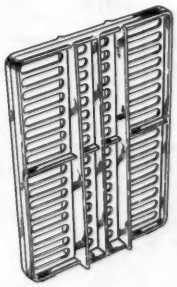




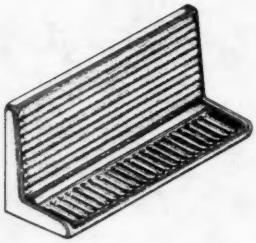
304,885
SEAT
Robert L. Wilson, Memphis, Tenn., assignor to Chromcraft Furniture Corporation, Senatobia, Miss.
Filed Apr. 18, 1988, Ser. No. 182,764
Term of patent 14 years
U.S. Cl. D6—379

304,886
SEAT
Edsel E. Murry, Coldwater, Miss., assignor to Chromcraft Furniture Corporation, Senatobia, Miss.
Filed Apr. 18, 1988, Ser. No. 182,569
Term of patent 14 years
U.S. Cl. D6—379

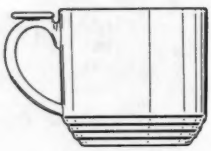
304,887
DIVIDER
Arthur R. Carlson, 401A Waverley Rd., East Malvern, 3144 Victoria, Australia
Filed Aug. 15, 1986, Ser. No. 897,067
Term of patent 14 years
U.S. Cl. D6—509



304,888
SOAP SHELF
E. Pekka Korpijaako, Rocky Hill, N.J., assignor to The Willette Corporation, New Brunswick, N.J.
Filed May 21, 1987, Ser. No. 52,802
Term of patent 14 years
U.S. Cl. D6—574

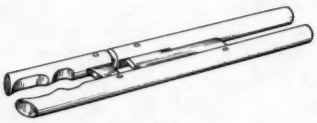


304,889
MUG
John F. Stymeist, 6321 Hollis St., Emeryville, Calif. 94608
Filed Sep. 4, 1987, Ser. No. 93,517
Term of patent 14 years
U.S. Cl. D7—9

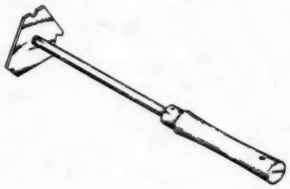


304,890
BEVERAGE CONTAINER HOLDER OR SIMILAR ARTICLE
Curtis B. Canaan, 12818 Ashford Brook, Houston, Tex. 77082
Filed Jun. 24, 1986, Ser. No. 877,985
Term of patent 14 years
U.S. Cl. D7—70

304,891
COMBINED NUTCRACKER AND BOTTLE OPENER
Lucio Borromeo, Turin, Italy, assignor to 3T S.p.A., Turin, Italy
Filed Jan. 22, 1987, Ser. No. 6,631
Claims priority, application Italy, Jul. 25, 1986, 53696/86[U]
Term of patent 14 years
U.S. Cl. D7—98

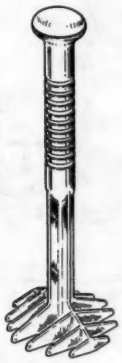


304,892
BARBECUE GRILL CLEANER
Romolo A. Bevilacqua, 3780 Plumas St., Reno, Nev. 89509
Filed Aug. 31, 1987, Ser. No. 91,620
Term of patent 14 years
U.S. Cl. D7—99



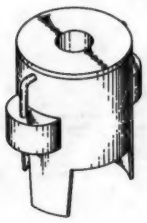
304,893
COOKING UTENSIL
Robert E. Scaggs, 9866 W. 200 N., Michigan City, Ind. 46368
Filed Aug. 14, 1986, Ser. No. 896,186
Term of patent 14 years
U.S. Cl. D7—99

304,894
POTATO MASHER
Arthur R. Carlson, East Malvern, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia
Filed Nov. 21, 1986, Ser. No. 933,597
Term of patent 14 years
U.S. Cl. D7—101

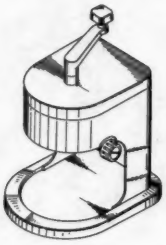


304,895
COMBINED KNIFE AND FORK
Wink Grisé, P.O. Box 647, and Frederick G. J. Grisë, P.O. Box 186, both of Osterville, Mass. 02655
Filed Jun. 18, 1986, Ser. No. 876,367
Term of patent 14 years
U.S. Cl. D7—148

304,896
CORN SILKER
Steven Eubanks, Rte. 4, Box 231 B, Lucedale, Mo. 39542
Filed Jul. 31, 1987, Ser. No. 79,917
Term of patent 14 years
U.S. Cl. D7—369

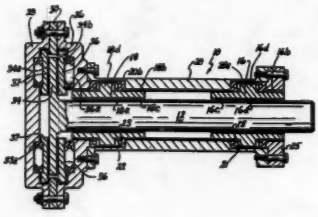


304,897
ICE SHAVER
Yong S. Lin, No. 8, Alley 41, Lane 189, Sec. 1, An Chung Rd., Tainan, Taiwan
Filed Oct. 23, 1987, Ser. No. 111,572
Term of patent 14 years
U.S. Cl. D7—374

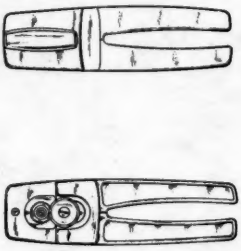


304,898
COMBINATION WRENCH AND SCREWDRIVER FOR SKATEBOARDS
William H. Brawner, 1174 Cloverleaf Dr., El Cajon, Calif. 92019, and Walter H. Tiedge, 9500 Harritt Rd., #144, Lakeside, Calif. 92040
Filed Mar. 2, 1987, Ser. No. 20,653
Term of patent 14 years
U.S. Cl. D8—26

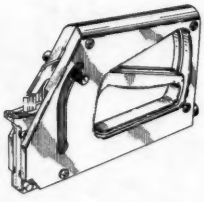
304,899
MULTI-FUNCTIONAL WRENCH
Chin-Lang Liu, No. 20, 7th Rd., Industrial Park, Taichung, Taiwan
Filed Mar. 25, 1987, Ser. No. 30,392
Term of patent 14 years
U.S. Cl. D8—23



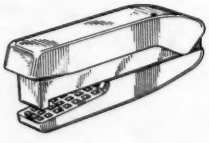
304,900
CAN OPENER
Gilles Miquelot, Rumilly, France, assignor to Tefal S.A., Rumilly, France
Filed Jun. 24, 1987, Ser. No. 65,571
Claims priority, application France, Jan. 7, 1987, 870057
Term of patent 14 years
U.S. Cl. D8—39



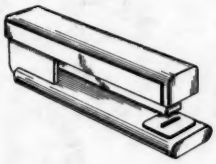
304,901
POINT DRIVER
Vincent T. Kozyrski, Plainville, and Alan R. Peters, Milford, both of Conn., assignors to The Fletcher-Terry Company, Farmington, Conn.
Filed Jul. 10, 1986, Ser. No. 884,270
Term of patent 14 years
U.S. Cl. D8—49



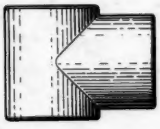
304,902
OFFICE STAPLER
Yoshiyuki Ebihara, 25-18, Kamiogi 4-chome, Suginami-ku, Tokyo, Japan
Filed Dec. 12, 1986, Ser. No. 941,277
Claims priority, application Japan, Jul. 15, 1986, 61-27628
Term of patent 14 years
U.S. Cl. D8—50



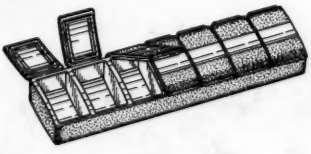
304,903
STAPLER
John Leszczak, Roselle Park, N.J.; Robert B. Staubitz, Avon, and William H. Valls, Harwinton, both of Conn., assignors to Bates Manufacturing Company, Hackettstown, N.J.
Filed Jan. 21, 1987, Ser. No. 6,029
Term of patent 14 years
U.S. Cl. D8—50



304,904
CLOSET HANGER ROD CONNECTOR
Russell F. Kercher, 645 Sabrina Way, Vista, Calif. 92084
Filed Aug. 15, 1988, Ser. No. 231,973
Term of patent 14 years
U.S. Cl. D8—380

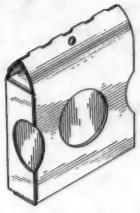


304,905
COMPARTMENTED CONTAINER OR THE LIKE
Larry G. Zimmerman, North Smithfield, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Feb. 24, 1987, Ser. No. 18,383
Term of patent 14 years
U.S. Cl. D9—341



304,906
SYRUP BOTTLE
Roger C. Panella, New Castle, Pa., assignor to Double R Enterprises, New Castle, Pa.
Filed Oct. 24, 1986, Ser. No. 922,983
Term of patent 14 years
U.S. Cl. D9—383

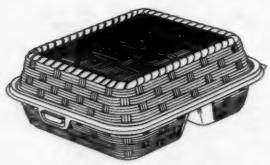
304,907
CARTON
Donald Tamsen, Omaha, Nebr., and Gerald R. Ormsby, Aurora, Ill., assignors to Conagra, Inc., Omaha, Nebr.
Filed Sep. 30, 1986, Ser. No. 916,208
Term of patent 14 years
U.S. Cl. D9—418



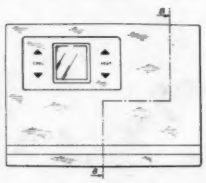
304,908
PACKAGING CONTAINER
Eiji Natori, Konosu, Japan, assignor to Chuo Kagaku Kabushiki Kaisha, Saitama, Japan
Filed Jun. 24, 1986, Ser. No. 877,839
Claims priority, application Japan, Jan. 10, 1986, 61-405
Term of patent 14 years
U.S. Cl. D9—423

304,909
PACKAGING CONTAINER
Eiji Natori, Konosu, Japan, assignor to Chuo Kagaku Kabushiki Kaisha, Saitama, Japan
Filed Jun. 24, 1986, Ser. No. 877,837
Claims priority, application Japan, Jan. 10, 1986, 61-407
Term of patent 14 years
U.S. Cl. D9—423

304,910
PACKAGING CONTAINER
Eiji Natori, Konosu, Japan, assignor to Chuo Kagaku Kabushiki Kaisha, Saitama, Japan
Filed Jun. 24, 1986, Ser. No. 877,838
Claims priority, application Japan, Jan. 10, 1986, 61-406
Term of patent 14 years
U.S. Cl. D9—423

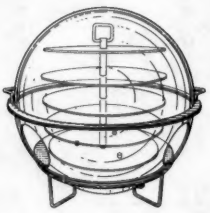


304,911
THERMOSTAT HOUSING OR THE LIKE
Jeffrey L. Parker, and Edward Parker, both of Jacksonville, Fla., assignors to Parker Electronics, Inc., Jax, Fla.
Filed Feb. 12, 1987, Ser. No. 13,866
Term of patent 14 years
U.S. Cl. D10—60

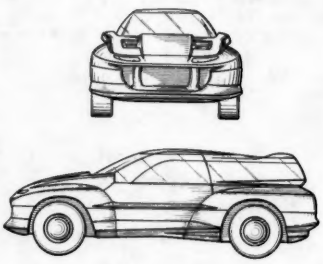


304,912
COMBINED MEXICAN JUMPING BEAN TUMBLER AND FINGER RING
Nelson Wood, 20 Dean Rd., Brookline, Mass. 02146
Filed Dec. 2, 1986, Ser. No. 937,190
Term of patent 14 years
U.S. Cl. D11—26

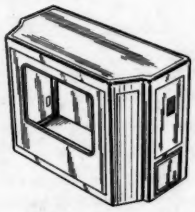
304,913
CONTROLLED ENVIRONMENT CHAMBER FOR PLANT PROPAGATION, BIOLOGICAL TESTING OR THE LIKE
Alan C. Cassells, Bridge House, Ghileen, Whitegate, County Cork, and Alan D. Rynhart, Tamney, Delgany, County Wicklow, both of Ireland
Filed Jan. 30, 1987, Ser. No. 8,921
Claims priority, application United Kingdom, Sep. 18, 1986, 1036781
Term of patent 14 years
U.S. Cl. D11—145



304,914
AUTOMOBILE
Steven D. Winter, Agoura Hills, Calif., assignor to Magna International (Canada) Inc., Ontario, Canada
Filed Dec. 7, 1987, Ser. No. 129,687
Term of patent 14 years
U.S. Cl. D12—91



304,915
SLEEPER CAB FOR CARGO TRUCKS
Richard A. Bentz, Fort Wayne, Ind., assignor to Bentz Metal Products, Company, Inc., Fort Wayne, Ind.
Filed Apr. 24, 1987, Ser. No. 41,921
Term of patent 14 years
U.S. Cl. D12—96



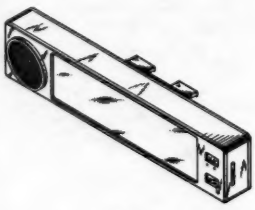
304,916
DOLL CARRIAGE
Alain Monneret, Voiteur, France, assignor to Monneret Jouets, Lons Le Saunier, France
Filed Jul. 14, 1987, Ser. No. 73,199
Term of patent 14 years
U.S. Cl. D12—129

304,917
TIRE FOR VEHICLE
Silvana Hinrichsen, Rome, Italy, assignor to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Apr. 13, 1987, Ser. No. 38,273
Claims priority, application Italy, Oct. 24, 1986, 53 994-B/86
The portion of the term of this patent subsequent to Dec. 5, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—146

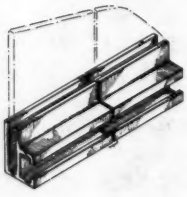
304,918
TIRE FOR VEHICLE
Silvana Hinrichsen, Rome, Italy, assignor to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Apr. 13, 1987, Ser. No. 38,272
Claims priority, application Italy, Oct. 24, 1986, 53 996-B/86
The portion of the term of this patent subsequent to Dec. 5, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—146

304,919
TIRE FOR VEHICLE
Silvana Hinrichsen, Rome, Italy, assignor to Bridgestone/Firestone, Inc., Akron, Ohio
Filed Jul. 9, 1987, Ser. No. 71,497
Claims priority, application Italy, Feb. 12, 1987, 52993/87[U]
Term of patent 14 years
U.S. Cl. D12—147

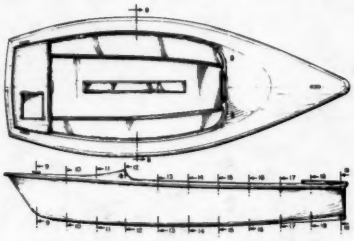
304,920
COMBINED REAR VIEW MIRROR, CLOCK AND RADIO
Arthur Schifrin, 4652 Via Marina, Marina Del Rey, Calif. 90292
Filed Jun. 26, 1987, Ser. No. 67,858
Term of patent 14 years
U.S. Cl. D12—188



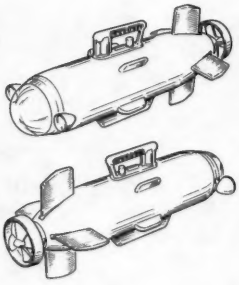
304,921
BUG AND STONE DEFLECTOR SHIELD MOUNT FOR AUTOMOBILES AND THE LIKE
John F. Castagna, Milford, Pa., assignor to Sparkomatic Corporation, Milford, Pa.
Filed May 4, 1987, Ser. No. 45,845
Term of patent 14 years
U.S. Cl. D12—190



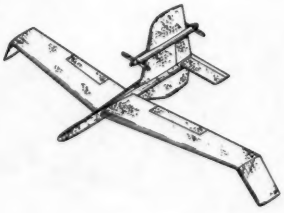
304,922
SAILBOAT HULL
Bruce Kirby, 213 Rowayton Ave., Rowayton, Conn. 06853
Filed Oct. 28, 1987, Ser. No. 114,523
Term of patent 14 years
U.S. Cl. D12—303



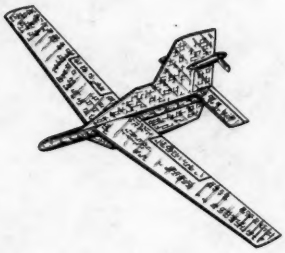
304,923
UNDERWATER VEHICLE
John T. Pado, City Beach, Australia, assignor to Underwater Systems Australia Limited, Fremantle, Australia
Filed Jun. 1, 1987, Ser. No. 55,871
Claims priority, application Australia, Dec. 5, 1986, 7800/86
Term of patent 14 years
U.S. Cl. D12—308



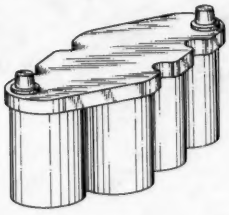
304,924
AIRCRAFT
Gordon Rosenthal, Jericho, N.Y., assignor to Fairchild Industries, Inc., Chantilly, Va.
Filed Sep. 15, 1987, Ser. No. 96,386
Term of patent 14 years
U.S. Cl. D12—331



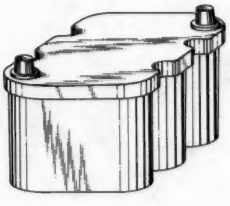
304,925
AIRCRAFT
Gordon Rosenthal, Jericho, N.Y., assignor to Fairchild Industries, Inc., Chantilly, Va.
Filed Sep. 15, 1987, Ser. No. 96,387
Term of patent 14 years
U.S. Cl. D12—331



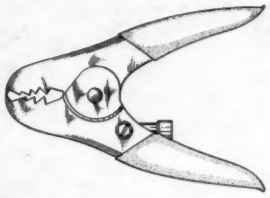
304,926
BATTERY
Larry K. W. Ching, Jr., Littleton, Colo., assignor to Gates Energy Products, Inc., Gainesville, Fla.
Filed May 13, 1988, Ser. No. 194,077
Term of patent 14 years
U.S. Cl. D13—8



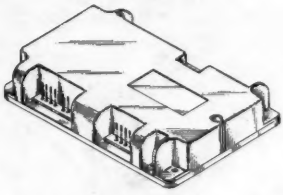
304,927
BATTERY
Larry K. W. Ching, Jr., Littleton, and Neil Puester, Aurora, both of Colo., assignors to Gates Energy Products, Inc., Gainesville, Fla.
Filed May 13, 1988, Ser. No. 193,691
Term of patent 14 years
U.S. Cl. D13—8



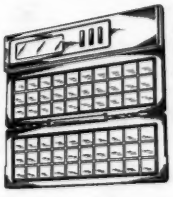
304,928
BATTERY CONTACT CLAMP FOR JUMPER CABLE
Max D. Mize, 712 N. Springfield, Anthony, Kans. 67003
Filed Feb. 24, 1986, Ser. No. 834,858
Term of patent 14 years
U.S. Cl. D13—10



304,929
ELECTRONIC CONTROL MODULE ENCLOSURE
Ronald W. Bench, Kirkville, and Richard J. Duell, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Nov. 15, 1988, Ser. No. 272,261
Term of patent 14 years
U.S. Cl. D13—12



304,930
PORTABLE DATA INPUT TERMINAL
Miyoji Hongo, and Katsumi Yonetsu, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan
Filed Mar. 19, 1986, Ser. No. 845,069
Claims priority, application Japan, Sep. 19, 1985, 60-39449
Term of patent 14 years
U.S. Cl. D14—100



304,931

OPERATION AND CONTROL UNIT FOR A COMPUTER

Masaki Hara; Sadao Shiratani; Masaharu Sawatani, and Masataka Fukunaga, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

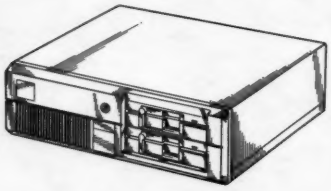
Filed Jun. 20, 1986, Ser. No. 880,667

Claims priority, application Japan, Dec. 20, 1985, 60-53034

The portion of the term of this patent subsequent to Apr. 5, 2002, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—100



304,932

COMBINED COMPUTER DISPLAY TERMINAL AND TELEPHONE

Takao Oura, and Nobuo Hata, both of Kamakura, Japan, assignors to Mitsubishi Denka Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1987, Ser. No. 7,443

Claims priority, application Japan, Jul. 29, 1986, 61-29640

Term of patent 14 years

U.S. Cl. D14—101

304,933

READER/WRITER FOR IC CARDS

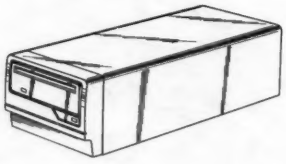
Shigeru Sutoh, Urawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jan. 6, 1987, Ser. No. 1,083

Claims priority, application Japan, Aug. 12, 1986, 61-31371

Term of patent 14 years

U.S. Cl. D14—105



304,934

IMAGE SCANNER

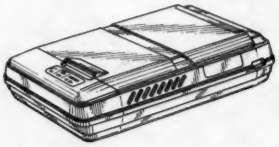
Susumu Koshino, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 125,043

Claims priority, application Japan, May 25, 1987, 62-20553

Term of patent 14 years

U.S. Cl. D14—107



304,935

MODEM OR SIMILAR ARTICLE

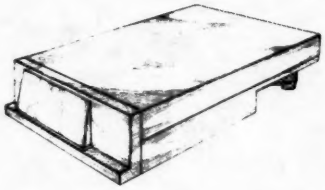
Peter H. Muller, Los Gatos; Peter E. Lowe, Palo Alto, and Randy J. Bleske, San Jose, all of Calif., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Feb. 3, 1987, Ser. No. 10,575

The portion of the term of this patent subsequent to Dec. 5, 2003, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—107



304,936

MODEM OR SIMILAR ARTICLE

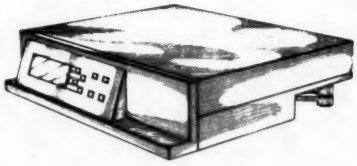
Peter H. Muller, Los Gatos; Peter E. Lowe, Palo Alto, and Randy J. Bleske, San Jose, all of Calif., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed May 8, 1987, Ser. No. 47,058

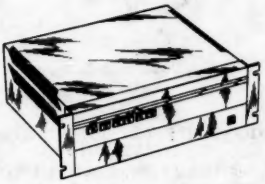
The portion of the term of this patent subsequent to Dec. 5, 2003, has been disclaimed.

Term of patent 14 years

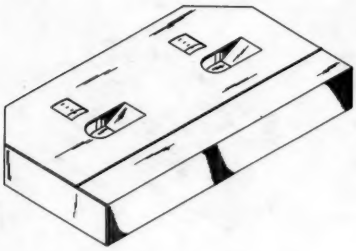
U.S. Cl. D14—107



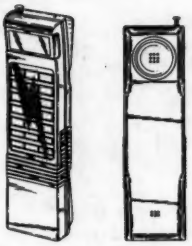
304,937
PROCESSOR FOR MAGNETIC IMAGE DATA FROM A STILL VIDEO CAMERA
Kazuaki Sakuta, Koganei, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 20, 1987, Ser. No. 16,862
Claims priority, application Japan, Aug. 25, 1986, 61-33038
Term of patent 14 years
U.S. Cl. D14—109



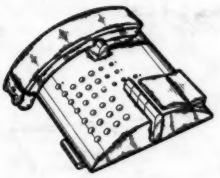
304,938
LIGHTWEIGHT MAGNETIC TAPE CASSETTE
John J. Lowe, Anaheim; Robert L. Stipe, Buena Park, and Alan J. Fujii, Irvine, all of Calif., assignors to Diversified Visual Techniques, Inc., Buena Park, Calif.
Filed Mar. 24, 1987, Ser. No. 29,597
Term of patent 14 years
U.S. Cl. D14—121

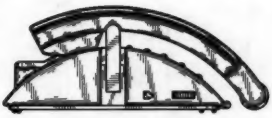


304,939
PORTABLE HANDSET RADIO TELEPHONE
Shigeru Sutoh, Urawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Mar. 24, 1988, Ser. No. 172,339
Claims priority, application Japan, Nov. 5, 1987, 62-44920
Term of patent 14 years
U.S. Cl. D14—138

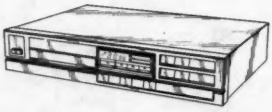


304,940
COMBINATION TELECOMMUNICATION SET
Herbert Pfeifer, Campbell; Paul Montgomery, San Francisco, and Dan Sturges, Campbell, all of Calif., assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Aug. 16, 1988, Ser. No. 232,881
Claims priority, application Rep. of Korea, Apr. 19, 1988, 1988-5288
Term of patent 14 years
U.S. Cl. D14—151

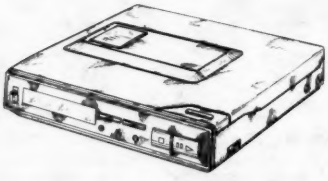




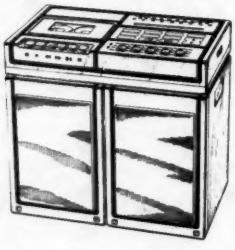
304,941
COMPACT DISC PLAYER
Masafumi Ito; Sigeru Hasegawa; Haruki Takita, and Minoru Sube, all of Tokyo, Japan, assignors to TEAC Corporation, Tokyo, Japan
Filed Jun. 18, 1986, Ser. No. 875,792
Claims priority, application Japan, Dec. 19, 1985, 60-52866
Term of patent 14 years
U.S. Cl. D14—156



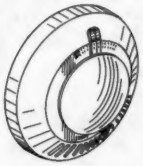
304,942
DIGITAL AUDIO COMPACT DISK PLAYER
Seiji Katsoka, Saitama, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Dec. 17, 1986, Ser. No. 943,914
Claims priority, application Japan, Jun. 17, 1986, 61-23510
Term of patent 14 years
U.S. Cl. D14—156



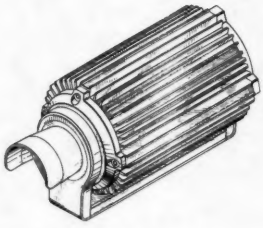
304,943
COMBINED STEREO RADIO AND TAPE PLAYER/RECORDER
Stuart D. Saunders, Box 42829-244, Houston, Tex. 77242
Filed May 30, 1986, Ser. No. 869,056
Term of patent 14 years
U.S. Cl. D14—162



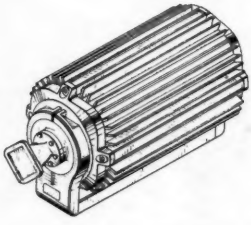
304,944
RADIO RECEIVER
John W. Behringer, 143 Main St., North Kingstown, R.I. 02852
Filed Apr. 2, 1987, Ser. No. 35,497
Term of patent 14 years
U.S. Cl. D14—188



304,945
TRANSMISSION AND RECEPTION UNIT FOR A MINI EARTH STATION
Yuhei Kosugi, and Yoshio Minowa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Feb. 18, 1987, Ser. No. 16,142
Claims priority, application Japan, Aug. 18, 1986, 61-32109
Term of patent 14 years
U.S. Cl. D14—231

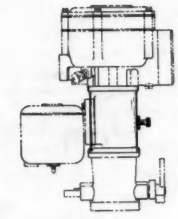


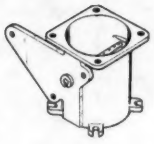
304,946
TRANSMITTER AND RECEIVER FOR MICROWAVE COMMUNICATIONS
Shigeo Ogawa, and Yoshio Minowa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Nov. 30, 1988, Ser. No. 278,310
Claims priority, application Japan, May 30, 1988, 63-21467
Term of patent 14 years
U.S. Cl. D14—231



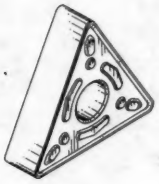
304,947
TROLLING MOTOR STEERING ATTACHMENT
Larry C. Reynolds, 1441 Lakeview, Wylie, Tex. 75098
Filed May 26, 1987, Ser. No. 54,008
Term of patent 14 years
U.S. Cl. D15—4

304,948
CARBURETOR FLOAT BOWL ADAPTER FOR USE IN OILFIELD PUMPING EQUIPMENT
Thomas L. Davis, Tulsa, and Roy A. Harper, Broken Arrow, both of Okla., assignors to Arrow Specialty Company, Tulsa, Okla.
Filed Mar. 27, 1987, Ser. No. 30,603
Term of patent 14 years
U.S. Cl. D15—5



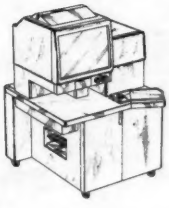


304,949
CUTTING TOOL INSERT
Kenneth L. Niebauer, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.
Filed Jan. 22, 1988, Ser. No. 147,005
Term of patent 14 years
U.S. Cl. D15—139

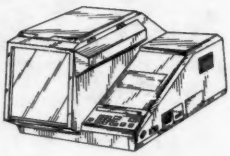


304,950
EYEGLASSES FOR MAKE-UP APPLICATION
Henri Guillet, 2boulevard Georges Clémenceau, Oyonnax, France (01100)
Filed Nov. 17, 1987, Ser. No. 121,999
Term of patent 14 years
U.S. Cl. D16—102

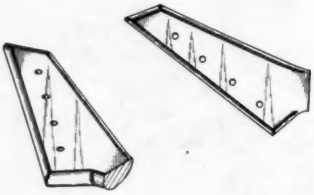
304,951
MICROFILM READER PRINTER
Tatsuo Kojima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 29, 1986, Ser. No. 890,390
Claims priority, application Japan, Jan. 30, 1986, 61-3142
Term of patent 14 years
U.S. Cl. D16—223



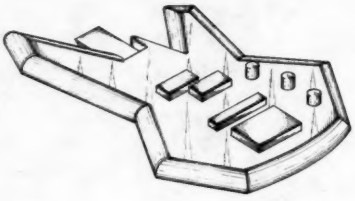
304,952
MICROFILM CAMERA READER
Hiroshi Fukuda, and Masahiro Fukuda, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed May 14, 1986, Ser. No. 865,903
Claims priority, application Japan, May 8, 1985, 60-18550
Term of patent 14 years
U.S. Cl. D16—225



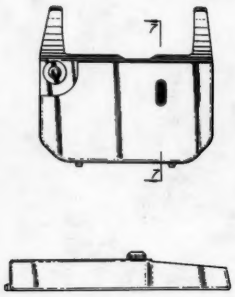
304,953
GUITAR HEADSTOCK
Stephen T. Ridinger, Irvine, and Russell E. Orr, II, El Toro, both of Calif., assignors to Evets Corporation, Irvine, Calif.
Filed Jun. 4, 1987, Ser. No. 57,865
Term of patent 14 years
U.S. Cl. D17—20



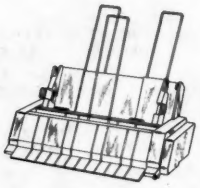
304,954
GUITAR BODY
Stephen T. Ridinger, Irvine, and Russell E. Orr, II, El Toro, both of Calif., assignors to Evets Corporation, Irvine, Calif.
Filed Jun. 4, 1987, Ser. No. 57,866
Term of patent 14 years
U.S. Cl. D17—20



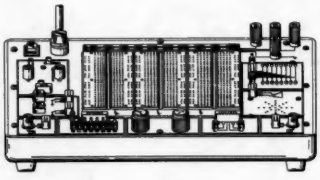
304,955
CARTRIDGE FOR INK RIBBON
Akira Tsukada, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 31, 1986, Ser. No. 948,299
Claims priority, application Japan, Jul. 1, 1986, 61-25803
Term of patent 14 years
U.S. Cl. D18—12



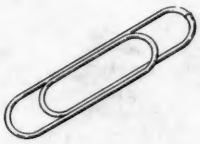
304,956
PAPER FEEDER FOR PRINTER
Seiichi Omino, Tokyo, and Jun Katayanagi, Musashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 23, 1986, Ser. No. 867,294
Claims priority, application Japan, Nov. 28, 1985, 60-49703
Term of patent 14 years
U.S. Cl. D18—22



304,957
EXPERIMENTAL ELECTRONICS TRAINER
Robert A. Melone, North Haven, Conn., assignor to Interplex Electronics,Inc., New Haven, Conn.
Filed Oct. 3, 1986, Ser. No. 915,036
Term of patent 14 years
U.S. Cl. D19—62

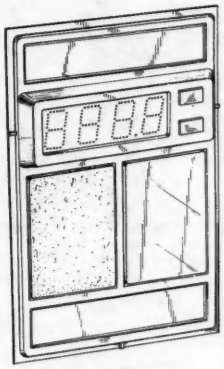


304,958
FILE CLIP
Mario B. Gutierrez, 128 Glenarm, San Antonio, Tex. 78201
Filed Dec. 30, 1985, Ser. No. 814,894
Term of patent 14 years
U.S. Cl. D19—65



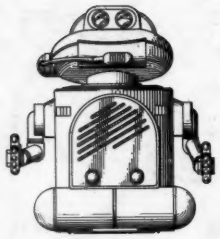
304,959
RECTANGULAR HOLDER FOR SMALL METALLIC OBJECTS
Feather W. King, 165 Reiten Dr., Ashland, Oreg. 97520
Continuation-in-part of Ser. No. 442,156, Nov. 16, 1982, Pat. No. Des. 282,380, which is a continuation-in-part of Ser. No. 133,434, Mar. 24, 1980, Pat. No. Des. 266,934. This application Nov. 18, 1985, Ser. No. 805,463
The portion of the term of this patent subsequent to Nov. 16, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—75

304,960
DISPLAY BOARD WITH TIMER
John B. Denton, Cheshire, England, assignor to Hazel Grove Music Company Limited of Bulkeley House, Cheadle, England
Filed May 19, 1987, Ser. No. 52,022
Claims priority, application United Kingdom, Jan. 17, 1987, 1039316
Term of patent 14 years
U.S. Cl. D20—20

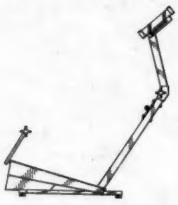


304,961
TOY CONSTRUCTION ELEMENT
Herbert C. Weiland, Rancho Palos Verdes, Calif., assignor to Clover Toys, Inc., LaMirada, Calif.
Filed Jun. 20, 1988, Ser. No. 208,546
Term of patent 14 years
U.S. Cl. D21—108

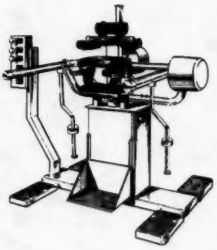
304,962
TOY ROBOT
Makiko Watanabe, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan
Filed Aug. 15, 1986, Ser. No. 897,121
Claims priority, application Japan, Feb. 28, 1986, 61-7018
Term of patent 14 years
U.S. Cl. D21—150



304,963
BICYCLE EXERCISE STAND
Bruce A. Sargeant, Orange; Robert Reasons, Mission Viejo; Mark Hoffenberg, Laguna Niguel; Robert Walpert, Monterey Park, and James Lindsay, Brea, all of Calif., assignors to Frontline Technology, Inc., Irvine, Calif.
Filed Mar. 13, 1987, Ser. No. 25,801
Term of patent 14 years
U.S. Cl. D21—194



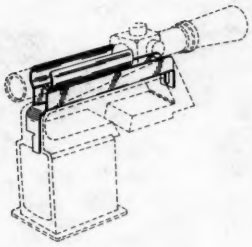
304,964
LOW BACK EXERCISER
Donald R. McIntyre, Chapel Hill, and James E. Miles, Graham, both of N.C., assignors to Isotechnologies, Inc., Hillsborough, N.C.
Filed Jun. 9, 1987, Ser. No. 59,823
Term of patent 14 years
U.S. Cl. D21—195



304,965
GAME PADDLE
John L. Giungo, Dresher; Keith Roseman, Philadelphia, both of Pa., and Paul B. McNutt, R.R. 1, Box 380 #417, Wailuku, Hi. 96793, assignors to Paul B. McNutt, Sunland, Calif.
Filed Apr. 27, 1987, Ser. No. 42,696
Term of patent 14 years
U.S. Cl. D21—213

304,966
TENT
Lawrence C. Eppenbach, 900 First Ave. South, #303, Seattle, Wash. 98134
Filed Sep. 10, 1987, Ser. No. 94,924
Term of patent 14 years
U.S. Cl. D21—253

304,967
TELESCOPIC SIGHT MOUNT
Harry R. Klumpp, South Gate, Calif., assignor to Fontaine Industries, Inc., Long Beach, Calif.
Filed May 4, 1987, Ser. No. 45,143
Term of patent 14 years
U.S. Cl. D22—110



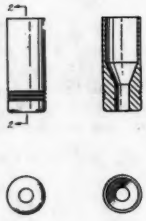
304,968
TARGET
Kenneth J. Mosser, P.O. Box 242, Clarissa, Minn. 56440
Filed Feb. 18, 1987, Ser. No. 16,197
Term of patent 14 years
U.S. Cl. D22—113

304,969
SHRIMP JIG WITH SPINNER
Robert P. Holzman, Portland, Oreg., assignor to Poulsen-Cascade Corporation, Portland, Oreg.
Filed Jun. 22, 1988, Ser. No. 210,112
Term of patent 14 years
U.S. Cl. D22—129

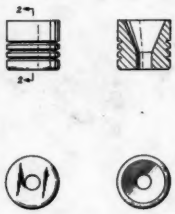
304,970
BICYCLE TIRE INFLATOR
Robert F. Gibb, 3013 Caminito Arenoso, San Diego, Calif. 92117
Filed Apr. 10, 1987, Ser. No. 37,561
Term of patent 14 years
U.S. Cl. D23—231

304,971
DRAIN CONTROL KNOB
Holly K. Yost, North Hollywood, Calif., assignor to Price Pfister, Inc., Pacoima, Calif.
Division of Ser. No. 860,766, May 7, 1986, Pat. No. Des. 299,052. This application Jul. 11, 1988, Ser. No. 216,973
Term of patent 14 years
U.S. Cl. D23—250

304,972
VIAL SUPPORT SLEEVE
James A. Baxter, London, England, assignor to Chromacol Limited, London, England
Filed Feb. 12, 1987, Ser. No. 13,926
Claims priority, application United Kingdom, Aug. 14, 1986, 1036091
The portion of the term of this patent subsequent to Aug. 1, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—29



304,973
VIAL SUPPORT SLEEVE
James A. Baxter, London, England, assignor to Chromacol Limited, London, England
Filed Feb. 12, 1987, Ser. No. 13,925
Claims priority, application United Kingdom, Aug. 14, 1986, 1036089
The portion of the term of this patent subsequent to Aug. 1, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—29



304,974
MASSAGER
Luc Heiligenstein, Chicago, Ill., assignor to Associated Mills Inc., Chicago, Ill.
Filed Nov. 6, 1986, Ser. No. 927,695
Term of patent 14 years
U.S. Cl. D24—41

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF DECEMBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

: *See*—
Au, Andrew N., 4,885,457, Cl. 219-548.000.

A. Ahlstrom Corporation: *See*—
Linsen, Lauri G., 4,884,516, Cl. 110-281.000.
Niskanen, Toivo, 4,884,943, Cl. 415-143.000.

A. O. Smith Corporation: *See*—
Huang, Vincent M. S., 4,884,555, Cl. 126-350.00R.

A-1 Construction Company: *See*—
Roberts, Edgar, 4,885,428, Cl. 174-6.000.

AB Stratos: *See*—
Nodfelt, Ingvar, 4,884,861, Cl. 350-96.180.

Abatjoglou, Anthony G.: *See*—
Billig, Ernst; Abatjoglou, Anthony G.; and Bryant, David R., 4,885,401, Cl. 568-454.000.

Abbott, Steven R., to United States of America, Energy. Integrally formed radio frequency quadrupole. 4,885,470, Cl. 250-396.00R.

Abe, Hideo: *See*—
Kenmochi, Kazuhito; Fukuhara, Akihiko; Komatu, Tomio; Kitahama, Masanori; Abe, Hideo; Kishida, Akira; Yanagishima, Fumiya; and Kobayashi, Makoto, 4,885,042, Cl. 148-12.00E.

Abe, Hiroki: *See*—
Mimuro, Tetsushi; Abe, Hiroki; Honda, Masahiro; and Mitsui, Takeshi, 4,884,647, Cl. 180-140.000.

Abe, Tokuji: *See*—
Amano, Tadashi; and Abe, Tokuji, 4,885,333, Cl. 524-762.000.

Abend, Phillip G., to Henkel Corporation. Neutralized alkyl ether sulfuric acid half-ester compositions containing polyhydroxy oligomers. 4,885,379, Cl. 558-34.000.

Abramson, Marc D. Reflective sign. 4,884,351, Cl. 40-606.000.

Abtahi, Amir. Omni-directional heat pipe. 4,884,627, Cl. 165-104.260.

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Kiechel, Jean-Rene ; Acezat-Mispelter, Francoise; and Plas, Danielle, 4,885,305, Cl. 514-356.000.

ACF Industries, Incorporated: *See*—
Dugge, Richard H., 4,884,723, Cl. 222-542.000.

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Inagaki, Yoshio; Adachi, Keiichi; and Suzuki, Yoshiaki, 4,885,228, Cl. 430-270.000.

Adachi, Nobuo; and Ogawa, Shinya, to Orc Manufacturing Co., Ltd. Exposure apparatus. 4,885,604, Cl. 355-30.000.

Adam, Rolf: *See*—
Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.

Adams, Allen R., Jr.: *See*—
Read, Edgar L.; Grant, Elwyn E.; Keto, Gary A.; Lin, Sharlene C.; Morgan, James D.; Nimon, Robert E.; Oldham, Oliver G.; Adams, Allen R., Jr.; and Salmones, Jose A., 4,885,739, Cl. 370-58.100.

Adams, Don L.: *See*—
Novis, Ari M.; Adams, Don L.; LaMontagne, Troy J.; and Sivahop, Albert, 4,885,514, Cl. 318-580.000.

Adams, Glenn R.: *See*—
Wallace, Graeme B.; and Adams, Glenn R., 4,884,411, Cl. 62-91.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Haruna, Tohru; Nishikawa, Kazunori; and Hamajima, Mitsuhiro, 4,885,326, Cl. 524-291.000.
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Tobita, Etsuo, 4,885,323, Cl. 524-95.000.

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Lavielle, Gilbert; and Lepagnol, Jean, 4,885,299, Cl. 514-253.000.
Peglion, Jean L.; Poignant, Jean C.; and Vian, Joel, 4,885,373, Cl. 549-458.000.

Adler, Alan: *See*—
Gordon, Bruce S.; and Adler, Alan, 4,885,114, Cl. 252-589.000.

Adolph Coors Company: *See*—
Patino, Hugo; Heard, George E.; Knudsen, Finn B.; and Gress, H. Stephen, 4,885,184, Cl. 426-592.000.

Advantest Corporation: *See*—
Yamaguchi, Takahiro; Kasahara, Toshiharu; and Kosawa, Hiromi, 4,885,708, Cl. 364-553.000.

AEG Aktiengesellschaft: *See*—
Kriechbaum, Karl, 4,885,442, Cl. 200-144.00B.

Aeroquip Corporation: *See*—
Webster, Alexander P., 4,884,591, Cl. 137-68.100.

Aerospatiale Societe Nationale Industrielle: *See*—
Lacombe, Jean F.; and Miane, Jean L., 4,885,527, Cl. 324-58.50C.

Affrossman, Stanley; Bakhshaee, Massoud; Pethrick, Richard A.; and Sherrington, David C., to National Research Development Corporation. Polymeric materials and their use as resists. 4,885,344, Cl. 525-302.000.

AGB Television Research: *See*—
Mabey, Kent W.; Boska, Joseph M.; and Richards, Stephen L., 4,885,632, Cl. 358-84.000.

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Aichert, Hans: *See*—
Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.

Aikawa, Kiyoshi I.: *See*—
Wessling, Ritchie A.; Schmidt, Donald L.; and Aikawa, Kiyoshi I., 4,885,355, Cl. 528-99.000.

Aileo, Jackson A., to Gentex Corporation. Combination chinstrap-napestrap assembly for helmet. 4,884,301, Cl. 2-421.000.

Air Products and Chemicals, Inc.: *See*—
Andre, Robert S., 4,885,063, Cl. 203-73.000.
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Andou, Masayasu; and Tajima, Ichiro, 4,885,218, Cl. 429-53.000.
Aoki, Kohji; Yasuda, Tomio; Masanori, Sugiyama; and Osamu, Komazawa, 4,885,566, Cl. 340-457.100.
Suzuki, Katsuo; and Umebayashi, Kazuyuki, 4,885,762, Cl. 379-58.000.

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Miura, Masakatsu; and Ando, Mashiko, 4,884,472, Cl. 74-763.000.

Aitchison, Colin S., to ERA Patents Limited. Logarithmic amplifier. 4,885,483, Cl. 307-492.000.

Ajinomoto Co., Inc.: *See*—
Ishida, Masaaki; Miwa, Kiyoshi; Nakamori, Shigeru; and Sano, Konosuke, 4,885,245, Cl. 435-108.000.

Akatsuka, Yuichiro: *See*—
Horiguchi, Toshio; Akatsuka, Yuichiro; and Tanaka, Hisakatsu, 4,885,458, Cl. 235-454.000.

Akazawa, Yukio: *See*—
Wakimoto, Tsutomu; and Akazawa, Yukio, 4,885,548, Cl. 330-260.000.

Akebono Brake Industry Co., Ltd.: *See*—
Maehara, Toshifumi, 4,884,492, Cl. 91-370.000.

Akebono Research and Development Centre Ltd: *See*—
Maehara, Toshifumi, 4,884,492, Cl. 91-370.000.

Akzo America Inc.: *See*—
Band, Elliot I.; and Eberhart, Suzanne T., 4,885,378, Cl. 556-426.000.

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Gray, Alan; and Arch, Alfred J., 4,885,141, Cl. 422-263.000.

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Hoffmann, Horst; Kersten, Peter; Volz, Hans; and Seyfried, Ulrich, 4,884,453, Cl. 73-776.000.
Stottlemyer, William O.; and Woodward, Steven J., 4,885,773, Cl. 379-420.000.

Alden, Frank; and Wyatt, James A., to Vermont Castings, Inc. Zero clearance fireplace. 4,884,556, Cl. 126-546.000.

Alfa Lancia Industries S.p.A: *See*—
Ciccarone, Angelo; Oldani, Emilio; and Scapecchi, Pier L., 4,884,539, Cl. 123-310.000.

Alkan, Sefik: *See*—
Meyer, Francois; Hinnen, Albert; Meister, Andreas; Grutter, Markus G.; and Alkan, Sefik, 4,885,166, Cl. 424-85.700.

Alkov, Leonard A.: *See*—
Bartholomew, Wesley E.; and Tolle, Michael C., 4,885,662, Cl. 361-386.000.

Allelix, Inc.: *See*—
Buxton, Franics P.; Gwynne, David I.; and Davies, Roger W., 4,885,249, Cl. 435-172.300.

Allen, Lisa P.: *See*—
Fan, John C. C.; Zavracky, Paul M.; Narayan, Jagdish; Allen, Lisa P.; and Vu, Duy-Phach, 4,885,052, Cl. 156-620.700.

Allen, Ross R.: *See*—
Kaplinsky, George; and Allen, Ross R., 4,885,595, Cl. 346-140.00R.

Allgauer, Gunter; Strohhacker, Peter; and Fuchs, Dieter, to Maschinenfabrik Bezner GmbH & Co. KG. Sorting machine. 4,884,700, Cl. 209-685.000.

Allied-Signal Inc.: *See*—
Chao, Tai-Hsiang, 4,884,960, Cl. 425-97.000.
Swedo, Raymond J.; and Zupancic, Joseph J., 4,885,091, Cl. 210-500.370.

Alpern, Marvin: *See*—
Roshdy, Constance E.; Cerwin, Robert J.; and Alpern, Marvin, 4,884,681, Cl. 206-63.300.

Alps Electric Co., Ltd.: *See*—
Yasumi, Yoshiyuki, 4,884,907, Cl. 400-216.100.

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Hoge, William H., 4,885,217, Cl. 429-27.000.

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Cormier, Michel J. N.; Ledger, Philip W.; Amkraut, Alfred; and Marty, Jean P., 4,885,154, Cl. 424-10.000.

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American Cyanamid: *See*—
Zwick, Maurice M., 4,885,092, Cl. 210-500.410.

American Home Products Corporation: *See*—
Surendra, Sehgal N.; and Vezina, Claude, 4,885,171, Cl. 424-122.000.

American Recreation Products, Inc.: *See*—
Scherer, Michael J., 4,884,303, Cl. 5-413.000.

American Standard Inc.: *See*—
Eber, David H.; and Ring, H. Kenneth, 4,884,590, Cl. 137-1.000.

American Telephone and Telegraph AT&T Bell Laboratories: *See*—
Vanderbei, Robert J., 4,885,686, Cl. 364-402.000.

American Telephone and Telegraph Company: *See*—
Douskalis, William, 4,885,741, Cl. 370-67.000.
Golden, Glenn D., 4,885,749, Cl. 371-32.000.
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Bowers, Thomas E.; Frey, Alan E.; Kerr, Howard A.; Russell, Larry A.; and Stone, Roger E., 4,885,738, Cl. 370-58.100.
Faris, Aziz I.; and Robertson, Perry J., 4,885,480, Cl. 307-448.000.
Myer, Robert E., 4,885,551, Cl. 330-52.000.

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Amkraut, Alfred: *See*—
Cormier, Michel J. N.; Ledger, Philip W.; Amkraut, Alfred; and Marty, Jean P., 4,885,154, Cl. 424-10.000.

Amoco Corporation: *See*—
Read, Randol R.; Warmack, Ralph E.; Farmer, James M.; Henshaw, Jerry D.; and Marshall, Connie T., 4,885,724, Cl. 367-77.000.
Reichmann, Mark G., 4,885,427, Cl. 585-480.000.
Snoddy, Michael L.; and Mount, Houston B., II, 4,885,540, Cl. 324-318.000.

Amos, Michael D.; Kovarik, David P.; and Kub, George F., Jr., to Erico International Corporation. Exothermic welding and method. 4,885,452, Cl. 219-130.400.

Amoyal, William E.; and Franckx, Joris R. I., to Raychem Corporation. Splice case. 4,885,432, Cl. 174-92.000.

AMP Incorporated: *See*—
Bakermans, Johannes C. W.; and Grabbe, Dimitry G., 4,884,484, Cl. 83-145.000.
Chandler, Curtis S.; and Marsh, Edward K., 4,884,981, Cl. 439-610.000.
Fleming, David F.; Kerlin, Harold W.; Pauza, William V.; and Sheesley, Wilmer L., 4,884,982, Cl. 439-620.000.
Waters, Mark H.; and Whiteman, Robert N., Jr., 4,884,336, Cl. 29-845.000.

Ampex Corporation: *See*—
Bennett, Phillip P., 4,885,638, Cl. 358-148.000.

Amstad, Paul: *See*—
Reddel, Roger R.; Yang, Ke; Rhim, Johng S.; Brash, Douglas; Su, Robert T.; Lechner, John F.; Gerwin, Brenda I.; Harris, Curtis C.; and Amstad, Paul, 4,885,238, Cl. 435-29.000.

Analog Devices, Inc.: *See*—
Barrow, Jeffrey G.; and Brokaw, Adrian P., 4,885,585, Cl. 341-169.000.

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Applied Research & Technology, Inc.: *See*—
Crampton, Timothy P., 4,885,521, Cl. 320-14.000.

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Gray, Alan; and Arch, Alfred J., 4,885,141, Cl. 422-263.000.

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Bird, Philip H.; and Armstrong, Desmond R., 4,885,477, Cl. 307-296.800.

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DeBlock, David A.; and Artwick, Kert E., 4,884,376, Cl. 52-90.000.

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Okuzumi, Fuminori; and Matsuda, Junichi, 4,884,476, Cl. 76-101.00R.
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Uramoto, Joshin; Suzuki, Koichi; Oyama, Takuji; and Kojima, Hiroyasu, 4,885,068, Cl. 204-192.110.
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Hamada, Tetsuo; Nakahashi, Junichi; and Nakai, Ryoichi, 4,885,340, Cl. 525-183.000.
Miura, Morikazu, 4,885,086, Cl. 210-321.800.
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Meylan, Pierre; and Novacek, Peter, 4,884,951, Cl. 416-191.000.
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Jhaveri, Satish S.; Dunnavant, William R.; and Langer, Heimo J., 4,884,620, Cl. 164-15.000.
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O'Brien, Dennis J.; Hanson, Paul G.; Klarquist, Thomas D.; Nepple, Bruce C.; Park, Michael C.; and Rosas, Robin R., 4,885,763, Cl. 379-67.000.
Ragan, Lawrence H., 4,885,802, Cl. 455-344.000.
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Dix, Willard A., 4,885,435, Cl. 200-1.00B.
Douskalis, William, 4,885,741, Cl. 370-67.000.
Golden, Glenn D., 4,885,749, Cl. 371-32.000.
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Spongh, Rolf T., 4,884,745, Cl. 239-3.000.
Au, Andrew N., to Raychem Corporation; and. Method of making a conductive polymer sheet. 4,885,457, Cl. 219-548.000.
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Buchl, Josef, 4,885,658, Cl. 361-154.000.
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Grunewald, Hans-Joachim; and Mennerich, Klaus-Peter, 4,884,825, Cl. 280-806.000.
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Jouguelet, Denis, 4,884,622, Cl. 164-45.000.
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McCormick, Peter E.; Culbertson, Timothy D.; and Autry, Walter D., Jr., 4,884,670, Cl. 192-56.00F.
AVCO Corporation: *See*—
Naik, Subhash K., 4,885,216, Cl. 428-680.000.
Tate, David L., 4,884,944, Cl. 415-156.000.
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Israel, Gary; Steenod, Wayne; and O'Mara, Richard C., 4,884,680, Cl. 206-44.110.
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Amjad, Zahid; and Masler, William F., 4,885,097, Cl. 210-701.000.
B & G Plastics, Inc.: *See*—
Kolton, Chester; and Spater, Stuart S., 4,884,726, Cl. 223-91.000.
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Pauley, James D.; and Ripingill, Allen E., Jr., 4,885,571, Cl. 340-573.000.
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Martell, David R., 4,884,467, Cl. 74-501.50R.
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Heilman, Thomas R.; and Norris, David M., 4,885,677, Cl. 364-184.000.
Bachmann, Peter K.; Geittner, Peter E.; Lydtin, Hans-Jurgen; and Romanowski, Gerd, to U.S. Philips Corp. Method for manufacturing rotationally symmetrical porous solid bodies. 4,885,018, Cl. 65-3.110.
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Tomoda, Toshimasa; Badono, Shinji; and Komaru, Masaki, 4,885,759, Cl. 378-53.000.
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Baggio, Giorgio; and Baratto, Mirko, to Nordica S.P.A. Locking and adjustment device particularly for ski boots. 4,884,760, Cl. 242-54.00R.
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Provost, George A.; and Bahro, Rita T., 4,884,323, Cl. 24-442.000.
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Stock, Werner; Baier, Manfred; Kaspar, Klaus P.; and Kirch, Peter, 4,885,255, Cl. 436-512.000.
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Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,885,414, Cl. 570-130.000.
Baird, Gary K., to Halliburton Logging Services, Inc. Hydraulic circuit use in wireline formation tester. 4,884,439, Cl. 73-155.000.
Baker, John W., to Intech, Inc. Cranial perforator with reentrant cutting segment. 4,884,571, Cl. 128-310.000.
Bakermans, Johannes C. W.; and Grabbe, Dimitry G., to AMP Incorporated. Strip retainer and stripper for stamping and forming machine. 4,884,484, Cl. 83-145.000.
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Affrossman, Stanley; Bakhshaee, Massoud; Pethrick, Richard A.; and Sherrington, David C., 4,885,344, Cl. 525-302.000.
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Sanchez Gonzalez, Juan, 4,885,447, Cl. 219-10.770.
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Haq, Ikram, 4,884,922, Cl. 405-303.000.
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Steinkamp, John O.; Ball, Garry L.; and Radke, Daniel D., 4,884,940, Cl. 414-715.000.
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Balmer, Norman L.: *See*—
Jackson, John E.; and Balmer, Norman L., 4,884,820, Cl. 277-53.000.
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Band, Elliot I.; and Eberhart, Suzanne T., to Akzo America Inc. Preparation of hexaalkylcyclotrisilthiane. 4,885,378, Cl. 556-426.000.
Banerjee, Chinmoy: *See*—
Mandel, Sheldon W.; and Banerjee, Chinmoy, 4,884,415, Cl. 62-277.000.
Banfield, William A. Collapsible sawhorse. 4,884,658, Cl. 182-129.000.
Banka, Eugene F.; and Hebeler, Charles B., to Unisys Corporation. Magnetic head having boron carbide surfaces. 4,885,650, Cl. 360-122.000.

Banks, James V. Single chamber filter vessel. 4,885,083, Cl. 210-108.000.

Baratto, Mirko: *See*—
Baggio, Giorgio; and Baratto, Mirko, 4,884,760, Cl. 242-54.00R.

Barczys, Daniel A. Broadband constant voltage multicoupler. 4,885,557, Cl. 333-124.000.

Barda, Rudolph C.: *See*—
Schmale, Gerhard; Gerich, Frank; and Barda, Rudolph C., 4,884,845, Cl. 297-367.000.

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Gardano, Andrea; Casagrande, Francesco; Foa, Marco; Petrini, Guido; Barisone, Riccardo; and Chapoy, Lawrence, 4,885,409, Cl. 568-834.000.

Barkouskie, Ronnie, to Dutton-Lainson Corporation. Spare tire rack. 4,884,729, Cl. 224-42.210.

Barnes Engineering Co.: *See*—
Gordon, Bruce S.; and Adler, Alan, 4,885,114, Cl. 252-589.000.
Moore, James E.; Kale, B. Michael; Csanak, George; and Luty, Fritz, 4,884,855, Cl. 350-1.100.

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Barriquand, Bernard; Villard, Francois; and Durantet, Bernard, 4,884,418, Cl. 68-150.000.

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Bartholomew, Bruce J., to General Dynamics Corporation, Convair Division. Device to detect frequency converted signals with high efficiency. 4,885,460, Cl. 250-216.000.

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Barthomeuf, Jean-Paul: *See*—
Revol, Gerard; Roillet, Maxime; and Barthomeuf, Jean-Paul, 4,884,931, Cl. 411-57.000.

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Parker, William A.; Bartos, Thomas E.; and Stewart, William M., 4,884,665, Cl. 188-322.170.

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Toja, Emilio; Gorini, Carlo; Barzaghi, Fernando; and Galliani, Giulio, 4,885,306, Cl. 514-425.000.
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Baschang, Gerhard; Hartmann, Albert; Hirt, Hans; Lucas, Bohumir; and Wirz, Peter, to Ciba-Geigy Corporation. Phosphorus compounds, processes for their manufacture, and their use. 4,885,285, Cl. 514-114.000.

BASF Aktiengesellschaft: *See*—
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Hahn, Erwin; and Neumann, Peter, 4,885,396, Cl. 568-315.000.
Huenig, Siegfried; Aumueller, Alexander; and Erk, Peter, 4,885,368, Cl. 544-347.000.
Steiner, Gerd; Teschendorf, Hans-Juergen; Unger, Liliane; and Binder, Rudolf, 4,885,278, Cl. 514-215.000.
Wahl, Ludwig; and Vogel, Helmut, 4,885,205, Cl. 428-285.000.

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Hoelderich, Wolfgang; Schneider, Kurt; and Hupfer, Leopold, 4,885,395, Cl. 568-314.000.

Bataille Industrie, S.A.: *See*—
Bataille, Jean, 4,884,349, Cl. 36-119.000.

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Schneider, William R., 4,885,009, Cl. 55-96.000.
Smith, Richard P.; Udseth, Harold R.; and Olivares, Jose A., 4,885,076, Cl. 204-299.00R.

Batts, Inc.: *See*—
Blanchard, Russell O., 4,884,727, Cl. 223-93.000.

Bauer, Harald: *See*—
Schimmel, Johannes; Bauer, Harald; Burian, Gunther; Hulla, Heinz; Kagerer, Robert; and Kubin, Helmut, 4,885,690, Cl. 364-424.100.

Bauer, Lothar: *See*—
Hanstein, Ullrich; and Bauer, Lothar, 4,885,281, Cl. 514-53.000.

Baxter International Inc.: *See*—
Nashef, Aws S.; and Ahmed, Ahmed I., 4,885,005, Cl. 8-94.110.

Bayer Aktiengesellschaft: *See*—
Eichenauer, Herbert; Pischtschan, Alfred; and Ott, Karl-Heinz, 4,885,337, Cl. 525-75.000.
Hartung, Sigurd, deceased; Hartung-Merse, Birgit, heir; Beck, Uwe; Kappler, Ulrich; Mitschker, Alfred; and Grafe, Andreas, 4,885,418, Cl. 570-211.000.
Lindner, Christian; Eichenauer, Herbert; Wittmann, Dieter; and Damrath, Volker, 4,885,209, Cl. 428-420.000.
Marhold, Albrecht; and Fischer, Reiner, 4,885,388, Cl. 564-417.000.
Marhold, Albrecht; and Braden, Rudolf, 4,885,415, Cl. 570-144.000.
Meyer, Horst; Schwenner, Eckhard; and Knorr, Andreas, 4,885,303, Cl. 514-332.000.
Podszun, Wolfgang; and Waniczek, Helmut, 4,885,191, Cl. 427-212.000.

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BBC Brown Boveri AG: *See*—
Gruning, Horst, 4,885,657, Cl. 361-91.000.

Beall, Richard W., Jr. Direct acting reverse osmosis water purifier valves. 4,885,085, Cl. 210-137.000.

Beam, Jerry E.: *See*—
Leonard, John F.; and Beam, Jerry E., 4,885,129, Cl. 419-2.000.

Bearden, John H.: *See*—
Whigham, Roger C.; and Bearden, John H., 4,884,720, Cl. 222-54.000.

Bechtel, James B. Securable and removable utility receptacle. 4,884,714, Cl. 220-69.000.

Beck, Kent L.; and Cunningham, Howard G., Jr., to Tektronix, Inc. System for graphically representing operation of object-oriented programs. 4,885,717, Cl. 364-900.000.

Beck, Uwe: *See*—
Hartung, Sigurd, deceased; Hartung-Merse, Birgit, heir; Beck, Uwe; Kappler, Ulrich; Mitschker, Alfred; and Grafe, Andreas, 4,885,418, Cl. 570-211.000.

Becker, Joachim H., to J. M. Huber Corporation. Computer terminal stand. 4,884,773, Cl. 248-639.000.

Beckwith, Walter L., Jr., to Brown & Sharpe Manufacturing Company. Calibration system for coordinate measuring machine. 4,884,889, Cl. 356-375.000.

Becton, Dickinson and Company: *See*—
Evans, Elizabeth L.; Gonchoroff, Nick J.; Greipp, Philip R.; Houck, David W.; Katzmann, Jerry A.; Kyle, Robert A.; and Loken, Michael R., 4,885,237, Cl. 435-6.000.
Karakelle, Mutlu; and Zdrahala, Richard J., 4,885,077, Cl. 204-403.000.
Vistins, Maris, 4,884,300, Cl. 2-162.000.

Bedi, Ram, to K.J. Manufacturing. Process for simple and high speed oil change and crank case flushing in an internal combustion engine. 4,884,660, Cl. 184-1.500.

Behrens, Dietmar; Hoog, Waldemar; and Zimmermann, Rudolf, to Elba-Ordner-Fabrik Kraut & Meienborn GmbH & Co. Device for storing a data diskette in a file folder. 4,884,691, Cl. 206-444.000.

Beierle, John D., to Nynex Corporation. Station controller for enhanced multi-line pick-up in centrex exchange telephone system. 4,885,769, Cl. 379-210.000.

Bekius, Wayne; and Svendsen, John, to Wagner Spray Tech Corporation. Flat tip for cup guns. 4,884,742, Cl. 239-71.000.

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Belanger, James A.; Wentworth, Robert J.; Turner, Barry S.; and Astley, Graham J., 4,884,946, Cl. 415-206.000.

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Bagley, Brian G.; and Quinn, William E., 4,885,186, Cl. 427-38.000.
Chan, Winston K., 4,885,231, Cl. 430-321.000.
Gopal, Gita; and Weinrib, Abel, 4,885,780, Cl. 379-221.000.
Hwang, Dah-min D.; and Nazar, Lawrence R., 4,885,051, Cl. 156-345.000.

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Svyatsky, Eduard, 4,884,797, Cl. 271-126.000.
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Benjamin, Lennette, to Synthelabo. Pharmaceutical compositions containing lysine acetylsalicylate. 4,885,288, Cl. 514-162.000.

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Millauer, Wolfgang; Benz, Gottfried; Pauli, Heinrich; and Hoyss, Franz, 4,885,511, Cl. 318-434.000.

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Lassmann, Eberhard; Helmling, Robert; and Beran, Franz, 4,885,146, Cl. 423-235.000.

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Suitor, Jerry W.; Berdahl, C. Martin; and Marner, Wilbur J., 4,885,142, Cl. 423-219.000.

Berg, Brian K. Automotive wedge guide. 4,884,664, Cl. 188-32.000.

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Lipton, Lenny; Berman, Arthur; and Meyer, Lawrence D., 4,884,876, Cl. 350-347.00E.

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Hogan, John D., 4,885,000, Cl. 600-21.000.

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Shaw, Richard J., 4,884,849, Cl. 300-4.000.

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Smallegan, Jon M.; and Bettger, Richard R., 4,884,835, Cl. 292-357.000.

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Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.

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Rezek, Ron, 4,884,947, Cl. 416-5.000.

Beyazov, Yordan Y.; Nenov, Sasho G.; and Peychev, Vlayko S., to Institute Po Technicheska Kibernetika I Robotika. Flow rate converter. 4,884,459, Cl. 73-861.520.

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Bilkadi, Zayn, to Minnesota Mining and Manufacturing Company. Photocurable abrasion resistant coatings comprising silicon dioxide dispersions. 4,885,332, Cl. 524-714.000.

Billig, Ernst; Abatjoglou, Anthony G.; and Bryant, David R., to Union Carbide Corporation. Bis-phosphite compounds. 4,885,401, Cl. 568-454.000.

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Steiner, Gerd; Teschendorf, Hans-Juergen; Unger, Liliane; and Binder, Rudolf, 4,885,278, Cl. 514-215.000.

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Chupka, David E.; and Landegger, Carl C., 4,885,090, Cl. 210-497.010.

Black & Decker Inc.: *See*—
Miner, Jonathan L.; Lacher, Vernon R.; Rescigno, Gerald J.; Swim, William B.; Gierke, Martin P.; and Hahn, David A., 4,884,314, Cl. 15-344.000.
Wheeler, Dale K., 4,885,496, Cl. 310-254.000.

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Blackmon, Laura M. Device for maintaining bedding in place. 4,884,305, Cl. 5-496.000.

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Folkers, Karl; and Wolaniuk, Janusz, 4,885,167, Cl. 424-94.100.

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Kraft, Kurt R., 4,884,772, Cl. 244-199.000.
Lamberty, Bernard J.; and Peters, Steven J., 4,885,556, Cl. 333-21.00A.

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Boisselle, Rene P. Ski spurs. 4,884,822, Cl. 280-605.000.

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van Der Lely, Ary; and Bom, Cornelis J. G., 4,884,640, Cl. 172-68.000.

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Boomgaard, Dirk J.: *See*—
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Boudewijns, Arnoldus J. J., to U.S. Philips Corporation. Oscillator phase control loop having plural switched current sources. 4,885,552, Cl. 331-1.00A.

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Rich, Douglas A.; Rick, Paul N.; Bournias, James N.; and Lyons, Robert E., 4,885,010, Cl. 55-241.000.

Bourrieres, Francis. Method and apparatus for brazing surface components onto a printed circuit board. 4,884,738, Cl. 228-180.200.

Boutin, Allan J.; and Ocheda, Daniel D., to John Crane, Inc. Dynamic seal arrangement for impeller pump. 4,884,945, Cl. 415-174.200.

Boutni, Omar M.; and Pratt, Charles F., to General Electric Company. Low gloss polycarbonate blend. 4,885,336, Cl. 525-67.000.

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Czajkowski, Didier; Labarthe, Joel; and Bouyou, Bertrand, 4,884,392, Cl. 56-13.100.

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Porter, Benny R.; and Bowers, Doyle G., 4,884,326, Cl. 29-156.80R.

Bowers, Thomas E.; Frey, Alan E.; Kerr, Howard A.; Russell, Larry A.; and Stone, Roger E., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method of and apparatus for establishing a wideband communication facility through a switched communications network having narrow bandwidth time division multiplexed channels. 4,885,738, Cl. 370-58.100.

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Brahmbhatt, Dhaval J., to ICT International CMOS Technology, Inc. Improved logic cell array using CMOS E^2 PROM cells. 4,885,719, Cl. 365-181.000.

Brancati, Rudolph P., to Nynex Corporation. Bracket for armored cord. 4,885,774, Cl. 379-438.000.

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Bray, Peter: *See*—
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Bremer, Karl-Heinz: *See*—
Oberhausen, Erich; Kuhlmann, Ludwig; Seibert, Gerhard; Steinstrasser, Axel; Schroth, Hans-Joachim; and Bremer, Karl-Heinz, 4,885,151, Cl. 424-1.100.

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Terzian, Rouben T., 4,884,991, Cl. 446-369.000.

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Brewster, Steven L., to Dow Chemical Company, The. Stable thiocyanogen composition. 4,885,150, Cl. 423-366.000.

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Briese, Tim K. Adjustable socket device. 4,884,480, Cl. 81-128.000.

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Brindisi, Anthony E.: *See*—
Smith, Charles R.; Brindisi, Anthony E.; and Tyree, Gerald W., 4,884,929, Cl. 411-3.000.

Brisson, Alfred G.: *See*—
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Bristol Fiberlite Industries, Inc.: *See*—
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Brita Wasser-Filter-Systeme GmbH: *See*—
Hankammer, Heinz, 4,885,089, Cl. 210-420.000.

British Broadcasting Corporation: *See*—
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Broadbent, Carolyn: *See*—
Hansen, Stuart; Fjeldsted, John; and Broadbent, Carolyn, 4,885,500, Cl. 313-256.000.

Broadhurst, Michael J.; Handa, Balraj K.; Johnson, William H.; Lawton, Geoffrey; and Machin, Peter J., to Hoffmann-La Roche Inc. Phosphinic acid derivatives. 4,885,283, Cl. 514-78.000.

Brockmeyer, Jerry W.; Aubrey, Leonard S.; and Dore, James E., to Swiss Aluminium Ltd. Ceramic foam filter and process for preparing same. 4,885,263, Cl. 501-81.000.

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Brokaw, Adrian P.: *See*—
Barrow, Jeffrey G.; and Brokaw, Adrian P., 4,885,585, Cl. 341-169.000.

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Hiroshi, Kawahara; and Kenji, Sakakibara, 4,885,602, Cl. 355-27.000.
Izaki, Takeshi; and Kawahara, Hiroshi, 4,884,501, Cl. 100-176.000.
Tomizawa, Takashi; and Takagi, Osamu, 4,885,603, Cl. 355-30.000.

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Brown, William R. Exhaust treating apparatus. 4,885,140, Cl. 422-174.000.

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Larson, Marlow W., 4,884,347, Cl. 33-265.000.

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Brunswick Corporation: *See*—
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Bryant, David R.: *See*—
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Buchl, Josef, to Audi AG. Apparatus for controlling the operation of an electromagnetic fuel intake or exhaust valve of an internal combustion engine. 4,885,658, Cl. 361-154.000.

Buck, Gregory M., to United States of America, National Aeronautics and Space Administration. Quantitative surface temperature measurement using two-color thermographic phosphors and video equipment. 4,885,633, Cl. 358-93.000.

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BULL HN Information Systems Inc.: *See*—
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Bunting, Earl L.; and Kovis, Michael, 4,885,795, Cl. 455-5.000.

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Schimmel, Johannes; Bauer, Harald; Burian, Gunther; Hulla, Heinz; Kagerer, Robert; and Kubin, Helmut, 4,885,690, Cl. 364-424.100.

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Burnham, Audrey R.; Ewards, Christopher J.; and Munn, Roger E., to CMB Packaging (UK) Limited. Security documents. 4,884,828, Cl. 283-89.000.

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Yu, Thomas C.; Vogt, Robert K.; and Wilkins, John J., 4,884,677, Cl. 198-370.000.

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Van Tol, Maurits W.; and Buter, Johannes H. A., 4,885,760, Cl. 378-82.000.

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Cable Manufacturing and Assembly Company, Inc.: *See—*
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Cain, John H., Jr.: *See—*
Iqbal, Tahir; Cain, John H., Jr.; and Slosky, Jack J., 4,885,100, Cl. 252-1.000.

CalComp Inc.: *See—*
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Rippel, Wally E., 4,884,631, Cl. 165-185.000.
Suitor, Jerry W.; Berdahl, C. Martin; and Marner, Wilbur J., 4,885,142, Cl. 423-219.000.

Callender, Daryl T. Work support structure. 4,884,791, Cl. 269-88.000.

Cambridge Filter Corporation: *See—*
Goulet, Roger; Cutri, Joseph; and DeYulio, Joseph, 4,885,015, Cl. 55-497.000.

Cambridge, Vivian J.: *See—*
Constant, W. David; Wolcott, Joanne M.; and Cambridge, Vivian J., 4,884,437, Cl. 73-54.000.

Camco, Incorporated: *See—*
Watson, Arthur L., 4,884,432, Cl. 72-410.000.

Camitz, Peter. Jointing device primarily for scaffold or stand system. 4,884,915, Cl. 403-171.000.

Camloc GmbH: *See—*
Dobbeler, Peter, 4,884,930, Cl. 411-6.000.

Campbell, Gordon C.: *See—*
Martinez, David M.; and Campbell, Gordon C., 4,884,344, Cl. 30-394.000.

Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, to Leybold Aktiengesellschaft. Method and apparatus for the application of materials. 4,885,070, Cl. 204-192.110.

Campbell, John G.; and Thompson, Allan, to Hollingsworth U.K. Ltd. Friction spinning unit and method of operating same. 4,884,394, Cl. 57-264.000.

Campbell, Roy; and Price, Anthony G., to Lucas Industries Public Limited Company. Pressure cylinder. 4,884,494, Cl. 92-129.000.

Campbell, Stephen M.; and Wozny, John C., to Borg-Warner Chemicals, Inc. Process and composition for stabilization of ar-brominated styrenic monmer against premature stabilization. 4,885,413, Cl. 570-104.000.

Canadian Patents and Development Limited/Societe Canadienne des Brevets et D'Exploitation Limited: *See—*
De Freitas, Anthony S. W.; McCulloch, Archibald W.; and McInnes, Alister G., 4,885,149, Cl. 423-339.000.

Canon Kabushiki Kaisha: *See—*
Ishihara, Shunichi; Ootoshi, Hirokazu; Hirooka, Masaaki; Hanna, Junichi; and Shimizu, Isamu, 4,885,258, Cl. 437-40.000.
Kato, Yoshiaki, 4,885,641, Cl. 358-296.000.
Shikakura, Akihiro; Takahashi, Koji; Takei, Masahiro; and Sasatani, Tomohiko, 4,885,637, Cl. 358-133.000.
Watanabe, Yoshitaka; Mizoguchi, Yoshiyuki; and Hiraga, Hiroyuki, 4,884,909, Cl. 400-625.000.
Yoshida, Takehiro, 4,885,755, Cl. 375-58.000.

Cantoni, Angelo, to Ital Idee s.r.l. an Italian Limited Liability Company. Multiple lubricating oil filter for internal combustion engines, with a member for monitoring the degree of clogging of the filtration surface. 4,885,082, Cl. 210-90.000.

Carboloy Inc.: *See—*
Kelm, Walter H.; and Newland, Paul W., 4,884,483, Cl. 82-160.000.

Carey, James R., to University of Minnesota, Regents of the. Trackig instrumentation for measuring human motor control. 4,885,687, Cl. 364-413.020.

Caribonum Ltd.: *See—*
Paffhausen, Hans; Hogarth, Ian; Scott, Andrew; and Mackintosh, Christine, 4,884,908, Cl. 400-241.200.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See—*
Zeller, Rudolf; and Kitzsteiner, Friedrich, 4,884,348, Cl. 33-502.000.

Carlo, Gulmini, to Govoni, SpA. System for recovering, selecting and recycling rejected plastic containers. 4,884,386, Cl. 53-438.000.

Carousel Commons: *See—*
Cho, David; and Steckler, Richard M., 4,884,662, Cl. 186-36.000.

Carpenter, Conrad L. Cane guard. 4,884,730, Cl. 224-162.000.

Carson, Mark E.: *See—*
Burger, Wilhelm F.; Carson, Mark E.; Johri, Abhai; and Stokes, Ellen J., 4,885,789, Cl. 380-25.000.

Casagrande, Francesco: *See—*
Gardano, Andrea; Casagrande, Francesco; Foa, Marco; Petrini, Guido; Barisone, Riccardo; and Chapoy, Lawrence, 4,885,409, Cl. 568-834.000.

Casey, Jon A.: *See—*
Anderson, Herbert R., Jr.; Divakaruni, Renuka S.; Dynys, Joseph M.; Kandetzke, Steven M.; Kirby, Daniel P.; Master, Raj N.; and Casey, Jon A., 4,885,038, Cl. 156-89.000.

Casey, Lawrence J.: *See—*
Mushinski, Roger J.; Lewis, Charles E.; and Casey, Lawrence J., 4,884,385, Cl. 53-399.000.

Cash, Walter, Jr.: *See—*
Kolodesh, Michael S.; Cash, Walter, Jr.; Davis, Jerry E.; Gosselin, Peter G.; Kock, Ronald W.; Pierson, Bruce A.; Reiboldt, H. Norman; Sabatelli, David A.; and Toms, Douglas, 4,885,182, Cl. 426-482.000.

Cassidy, Thomas: *See—*
Sharp, David P.; Lee, Charles H.; and Cassidy, Thomas, 4,885,482, Cl. 307-465.000.

Castagna, John F.: *See—*
Freadman, Tommyca; and Castagna, John F., 4,884,655, Cl. 181-145.000.

Castells, Raul: *See—*
Witkowski, Jan, 4,884,537, Cl. 123-248.000.

Castrilli, Paul. Nonlinear torsion spring. 4,884,790, Cl. 267-154.000.

Catalytica, Inc.: *See—*
Newman, Stanley F.; De Deken, Jacques C.; and Cook, Michael L., 4,885,399, Cl. 568-410.000.

Cates, Glenn F. Golf club alignment device and method. 4,884,813, Cl. 273-183.00D.

Celmac Limited: *See—*
Ozagir, Ozcan; and Proffitt, Raymond, 4,884,834, Cl. 292-350.000.

Center for Innovative Technology: *See—*
Sonenshine, Daniel; and Hamilton, James G. C., 4,884,361, Cl. 43-132.100.

Centorr Associates, Inc.: *See—*
Lavoie, Gerard H.; Miller, Charles W., Jr.; Currier, John K.; Saunders, Lionel F.; and Leary, Daniel J., 4,885,454, Cl. 219-390.000.

Centre De Recherches Metallurgiques Centrum Voor Research in De Metallurgie: *See—*
Terreur, Frederic, 4,885,751, Cl. 372-26.000.

Century Electric, Inc.: *See—*
Sisk, Hollis D., 4,885,495, Cl. 310-216.000.

Ceraver, S.A.: *See—*
Thevenet, Guy, 4,885,039, Cl. 156-294.000.

Cerwin, Robert J.: *See—*
Roshdy, Constance E.; Cerwin, Robert J.; and Alpern, Marvin, 4,884,681, Cl. 206-63.300.

Chai, Mong-Hsiang. Walker. 4,884,799, Cl. 272-70.300.

Chan, Luen C.; and Menozzi, Jay P., to Harris Corporation. Elevation interpolator for simulated radar display system. 4,884,971, Cl. 434-2.000.

Chan, Winston K., to Bell Communications Research, Inc. Phase-shifted gratings by selective image reversal of photoresist. 4,885,231, Cl. 430-321.000.

Chandler, Curtis S.; and Marsh, Edward K., to AMP Incorporated. Shielded data connector. 4,884,981, Cl. 439-610.000.

Change, Nicholas D., III. Exercise towel with magnetic anchoring means. 4,885,195, Cl. 428-36.100.

Chao, Patrick. Collapsible ladder. 4,884,659, Cl. 182-164.000.

Chao, Tai-Hsiang, to Allied-Signal Inc. Die for extruding and wash coating. 4,884,960, Cl. 425-97.000.

Chapman, Derek D.; and Weber, Helmut, to Eastman Kodak Company. Thiadiazolyl-azo-pyrazole yellow dye-donor element for thermal dye transfer. 4,885,272, Cl. 503-227.000.

Chapoy, Lawrence: *See—*
Gardano, Andrea; Casagrande, Francesco; Foa, Marco; Petrini, Guido; Barisone, Riccardo; and Chapoy, Lawrence, 4,885,409, Cl. 568-834.000.

Chappell, Norman W. Spectacle frame having removable decorative elements. 4,884,883, Cl. 351-52.000.

Che, Tessie M.: *See—*
Gillberg-LaForce, Gunilla E.; Leslie, Thomas M.; Che, Tessie M.; and Borzo, Marie, 4,885,113, Cl. 252-582.000.

Chemcast Corporation: *See—*
Patel, Praful J., 4,885,121, Cl. 264-255.000.

Chen, Kwang-Ho. Valve for checking tire pressure. 4,884,593, Cl. 137-557.000.

Chen, Mei H.: *See—*
Lee, Lain-tze; Chen, Mei H.; and Yao, Chung-Niang, 4,885,389, Cl. 564-418.000.

Chen, Wen-Sherng: *See—*
Soucie, William G.; Chen, Wen-Sherng; Witte, Vernon C.; Henry, George A.; and Drehkoff, William D., 4,885,179, Cl. 426-104.000.

Cheresnowsky, John, to GTE Products Corporation. Process for purifying molybdenum. 4,885,144, Cl. 423-54.000.

Cherry Semiconductor Corporation: *See—*
Gontowski, Walter S., Jr., 4,885,525, Cl. 323-315.000.

Chevron Research Company: *See—*
Pomidor, Patricia B., 4,885,027, Cl. 71-103.000.

Chien, Darin. Steal and burglar preventive purse. 4,885,570, Cl. 340-571.000.

Chien, Kuei-Ru; Hui, Kin-Kwok; Stovall, H. Dean; Wang, John H. S.; and Lamm, Albert J., to Hughes Aircraft Company. Crystal modulated laser with improved resonator. 4,885,752, Cl. 372-33.000.

Chinone, Naoki: *See—*
Okai, Makoto; Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; and Chinone, Naoki, 4,885,753, Cl. 372-45.000.

Cho, David; and Steckler, Richard M., to Carousel Commons. Driver interaction service center and method of operating such a center. 4,884,662, Cl. 186-36.000.

Cho, Lucky. Plate cutting device capable of being used to cut a plate along a curve. 4,884,485, Cl. 83-473.000.

Choi, King F., to Eastman Kodak Company. Expert system shell for building photofinishing diagnostic systems. 4,885,705, Cl. 364-525.000.

Choinski, Edward J., to Epicor Technology, Inc. Method for temporarily sealing holes in printed circuit boards utilizing a thermodeformable material. 4,884,337, Cl. 29-846.000.

Choung, Moon: *See—*
Maye, David; and Choung, Moon, 4,884,836, Cl. 294-101.000.

Christensen, Donald R.; Bateman, Robert; and Grancey, Thomas A., to Grass Valley Group, Inc., The. Audio mixer architecture using virtual gain control and switching. 4,885,792, Cl. 381-119.000.

Christiansen, David A.: *See—*
Vercellotti, Leonard C.; Anderson, Arthur A.; Christiansen, David A.; Johnson, Dannis R.; Brickner, Laurence R.; Colclaser III, Robert G.; and Leddy, John G., 4,885,564, Cl. 340-310.00A.

Christiansen, Hermann, to Kirby, Robert. Flow modification at the bifurcation of a branch channel from a main channel carrying a water flow. 4,884,917, Cl. 405-80.000.

Chrysler Motors Corporation: *See—*
DeRees, Delbert D., 4,884,843, Cl. 297-331.000.
Klein, Frank H.; Selby, Steven F.; and Klueger, Sigmund, 4,884,870, Cl. 350-319.000.
Klein, Frank H.; Selby, Steven F.; and Klueger, Sigmund, 4,884,872, Cl. 350-321.000.
McCambridge, John M., 4,885,583, Cl. 341-100.000.

Chu, Yung F.; Marler, David O.; and McWilliams, John P., to Mobil Oil Corporation. Transalkylation of polyaromatics. 4,885,426, Cl. 585-474.000.

Chuo Hatsujo Kabushiki Kaisha: *See—*
Muramatsu, Tadao; Hoshino, Shigeru; Suzuki, Kenichi; and Yamamuro, Shinichi, 4,884,468, Cl. 74-502.400.

Chupka, David E.; and Landegger, Carl C., to Black Clawson Company, The. Screen plates. 4,885,090, Cl. 210-497.010.

Churyo Engineering Kabushiki Kaishi: *See—*
Fujitani, Makoto; Hirabayashi, Masashi; Honda, Hideo; Machida, Hiroshi; Kondo, Masami; and Onoda, Sachio, 4,884,956, Cl. 418-15.000.

Ciba-Geigy Corporation: *See—*
Baschang, Gerhard; Hartmann, Albert; Hirt, Hans; Lucas, Bohumir; and Wirz, Peter, 4,885,285, Cl. 514-114.000.
Blackburn, John B.; and Hamilton, Alexander, 4,885,033, Cl. 106-494.000.
Hofer, Arnold; and Gempeler, Hans, 4,885,354, Cl. 528-94.000.
Kramer, Andreas; and Perritaz, Francis, 4,885,346, Cl. 525-426.000.
Meyer, Francois; Hinnen, Albert; Meister, Andreas; Grutter, Markus G.; and Alkan, Sefik, 4,885,166, Cl. 424-85.700.
Scheibli, Peter, 4,885,360, Cl. 534-642.000.

Ciccarone, Angelo; Oldani, Emilio; and Scapecchi, Pier L., to Alfa Lancia Industries S.p.A. Head for an internal combustion reciprocating engine. 4,884,539, Cl. 123-310.000.

Cichanowicz, Peggy W.; and Belly, Robert T., to Eastman Kodak Company. Rapid differentiation of bacteria using polyether antibiotics. 4,885,239, Cl. 435-34.000.

Cincinnati-Vulcan Company: *See—*
Sturwold, Robert J., 4,885,104, Cl. 252-48.400.

Cipriano, Vicki L.: *See—*
Cochran, Stuart A.; Benjamin, Earl J.; Crocker, Mary E.; Seidel, William C.; and Cipriano, Vicki L., 4,885,180, Cl. 426-241.000.

Citta, Richard W.; Long, Michael E.; and Mutzabaugh, Dennis M., to Zenith Electronics Corporation. Television signal encoder with reduced transient switching effects. 4,885,776, Cl. 380-15.000.

Citycrown, Inc.: *See—*
Council, Buford W., Jr., 4,884,482, Cl. 82-1.110.

Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; White, Danny R.; and Johnson, William B., to Lanxide Technology Company, LP. Process for preparing self-supporting bodies and products produced thereby. 4,885,130, Cl. 419-12.000.

Claas Ohg: *See—*
Hemker, Heinrich; and Heidjann, Franz, 4,884,993, Cl. 460-14.000.

Clark, Robert L.: *See—*
Whitehead, Lorne A.; Clark, Robert L.; and Curzon, Francis L., 4,885,783, Cl. 381-191.000.

Clark, Ronald M. Hand trowel. 4,884,312, Cl. 15-235.400.

Clifford, James R. Fish hook carrier. 4,884,357, Cl. 43-25.200.

Clorox Company, The: *See—*
Yang, Chihae; and Kaufmann, Edward J., 4,885,105, Cl. 252-90.000.

CMB Packaging (UK) Limited: *See—*
Burnham, Audrey R.; Ewards, Christopher J.; and Munn, Roger E., 4,884,828, Cl. 283-89.000.

Co-Ordinated Thermal Systems Pty. Ltd.: *See—*
Wallace, Graeme B.; and Adams, Glenn R., 4,884,411, Cl. 62-91.000.

Coad, Joseph P.; Rickerby, David S.; and Warrington, Philip, to United Kingdom Atomic Energy Authority. Coating improvements. 4,885,069, Cl. 204-192.310.

Coates, Vincent J., to Nanometrics Incorporated. Method for normalizing the detection signals of magnified images of fluorescing materials. 4,884,890, Cl. 356-384.000.

Coates, William J., to Smith Kline & French Laboratories Limited. Purinone derivatives which have bronchodilator, vasodilator and anti-allergic activities. 4,885,301, Cl. 514-263.000.

Cobe Laboratories, Inc.: *See—*
Leppert, Lawrence L., 4,885,001, Cl. 604-4.000.

Coca-Cola Company, The: *See—*
Whigham, Roger C.; and Bearden, John H., 4,884,720, Cl. 222-54.000.

Cochran, Stuart A.; Benjamin, Earl J.; Crocker, Mary E.; Seidel, William C.; and Cipriano, Vicki L., to General Foods Corporation. Microwaveable baked goods. 4,885,180, Cl. 426-241.000.

Cocozza, Salvatore, to Miat S.p.A. Insufflator for the administration of drugs in the form of a powder pre-dosed into opercola. 4,884,565, Cl. 128-203.210.

Coden, Michael H.: *See—*
Helbers, Jan; Scholl, Frederick W.; and Coden, Michael H., 4,885,743, Cl. 370-85.200.

Codenoll Technology Corporation: *See—*
Helbers, Jan; Scholl, Frederick W.; and Coden, Michael H., 4,885,743, Cl. 370-85.200.

Coe Manufacturing Company, The: *See—*
Ely, Gary W., 4,884,605, Cl. 144-357.000.

Coe, Thomas D., to Q A Technology Company, Inc. Electrical circuit test probe having an elongate cylindrical retaining and sliding bearing region. 4,885,533, Cl. 324-158.00P.

Coenraets, Benoit J. Roll-up shutter structure. 4,884,617, Cl. 160-271.000.

Coffin, David A.: *See—*
Vultaggio, Anthony; and Coffin, David A., 4,885,434, Cl. 200-4.000.

Cognitive Solutions, Inc.: *See—*
Berquist, John F., 4,884,904, Cl. 400-120.000.

Cohen, Donald M.: *See—*
Elliott, Clyde D.; and Cohen, Donald M., 4,884,567, Cl. 128-303.00R.

Colclaser III, Robert G.: *See—*
Vercellotti, Leonard C.; Anderson, Arthur A.; Christiansen, David A.; Johnson, Dannis R.; Brickner, Laurence R.; Colclaser III, Robert G.; and Leddy, John G., 4,885,564, Cl. 340-310.00A.

Coleman, Leonard J.: *See—*
Hardie, Laurie S.; and Coleman, Leonard J., 4,884,574, Cl. 128-373.000.

Coleman Outdoor Products, Inc.: *See—*
Sibley, Paul T., 4,884,731, Cl. 224-215.000.

Colgate, Brian M., to Lucas Industries Public Limited Company. Master cylinder assembly. 4,884,404, Cl. 60-581.000.

colgate-Palmolive Company: *See—*
Richter, Stephen P., 4,885,108, Cl. 252-134.000.

Collins, Jason H. Surgical speculum. 4,884,559, Cl. 128-17.000.

Collins Motor Corporation Limited: *See—*
Neale, Michael J.; and Polak, Thomas A., 4,884,536, Cl. 123-197.0AC.

Coloplast A/S: *See—*
Johannesson, Niels O., 4,885,049, Cl. 156-289.000.

Comalco Aluminum Limited: *See—*
May, Robin F., 4,885,045, Cl. 148-440.000.

Combustion Concepts, Inc.: *See—*
Meyer, Robert W., 4,884,967, Cl. 432-127.000.

Comfortex Corporation: *See—*
Schnebly, John; and Marusak, Thomas J., 4,884,612, Cl. 160-84.100.

Commissariat a l'Energie Atomique: *See—*
Blanpain, Roland; Le Masson, Patrick; and Vidal, Jean-Charles, 4,885,536, Cl. 324-207.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Hughan, Robert R.; Hannink, Richard H. J.; Swain, Michael V.; Stringer, Robert K.; Murray, Michael J.; and Garvie, Ronald C., 4,885,266, Cl. 501-104.000.

Compaq Computer Corporation: *See—*
Sharp, David P.; Lee, Charles H.; and Cassidy, Thomas, 4,885,482, Cl. 307-465.000.

Concept, Inc.: *See—*
Bays, F. Barry; Trott, Arthur F.; and Marchand, Sam R., 4,884,572, Cl. 128-334.00R.

Conception, Elaboration, Realisation D'Ensembles Electroniques et Mecaniques (C.E.R.E.M.): *See—*
Czajkowski, Didier; Labarthe, Joel; and Bouyou, Bertrand, 4,884,392, Cl. 56-13.100.

Confon AG: *See—*
Preusker, Rosel; and Preusker, Werner, 4,884,933, Cl. 411-177.000.

Conn, Robert W.: *See—*
Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.

Conoco Inc.: *See*—
Myers, Wilbur J., 4,885,726, Cl. 367-142.000.

Consolidation Coal Co.: *See*—
Bessinger, Stephen L.; and Nelson, Michael G., 4,884,847, Cl. 299-1.000.

Constant, W. David; Wolcott, Joanne M.; and Cambridge, Vivian J., to Louisiana State University. Method and apparatus for measuring fluid-fluid interfacial rheological properties. 4,884,437, Cl. 73-54.000.

Continental Industries, Inc.: *See*—
Dosmann, Thomas R., 4,884,497, Cl. 98-40.130.

Contraves Italiana S.p.A.: *See*—
Grattarola, Maurizuo; and Stella, Domenico, 4,884,464, Cl. 74-50.000.

Convotherm Elektrogerate GmbH: *See*—
Schwarzbacker, Werner, 4,884,553, Cl. 126-20.000.

Conway, Thomas G., to United States of America, Army. Production line emissivity measurement system. 4,884,896, Cl. 374-9.000.

Coogan, Ronald S., to Unisys Corporation. Self-testing peripheral-controller system. 4,885,683, Cl. 364-200.000.

Cook Jr., Charles R.: *See*—
Lee, Ki W.; and Cook Jr., Charles R., 4,884,443, Cl. 73-204.160.

Cook, Kenneth J., to GTE Valenite Corporation. Apparatus for linear measurements. 4,884,346, Cl. 33-542.000.

Cook, Michael L.: *See*—
Newman, Stanley F.; De Deken, Jacques C.; and Cook, Michael L., 4,885,399, Cl. 568-410.000.

Cooley, Craig H.: *See*—
Smith, Redd H.; and Cooley, Craig H., 4,884,477, Cl. 76-108.00A.

Coombs, Daniel M.: *See*—
Brown, Ronald E.; Hogan, Robert J.; Coombs, Daniel M.; and Kukes, Simon G., 4,885,080, Cl. 208-218.000.

Cooper Industries, Inc.: *See*—
Lazar, Lawrence W.; and Wainio, Ronald A., 4,885,444, Cl. 200-401.000.
Maye, David; and Choung, Moon, 4,884,836, Cl. 294-101.000.
Veverka, Edward F.; and Hassler, Stephen P., 4,885,561, Cl. 337-190.000.

Cooper, Roy; and Hansen, Charles, to Tri-tech, Inc. Method of making a stepper motor. 4,884,333, Cl. 29-596.000.

Corain, Luciano; Maitan, Gianni; and Valsecchi, Enrico, to NUOVO-PIGNONE-Industrie Meccaniche e Fonderia, S.p.A. System for instantaneously detecting breakage of a weft yarn in a multiphase loom shed. 4,884,598, Cl. 139-371.000.

Corbin, Normand D.; and Willkens, Craig A., to Norton Company. Fiber-reinforced silicon nitride composite ceramics. 4,885,199, Cl. 428-113.000.

Corbo, Thomas A.: *See*—
Kahl, John J., Jr.; Vulpitta, Brian A.; Corbo, Thomas A.; Saunders, Craig M.; and Nottingham, John R., 4,884,734, Cl. 225-26.000.

Cordis Corporation: *See*—
Hillstead, Richard A., 4,885,003, Cl. 604-22.000.

Cormier, Michel J. N.; Ledger, Philip W.; Amkraut, Alfred; and Marty, Jean P., to Alza Corporation. Method for reducing sensitization or irritation in transdermal drug delivery and means therefor. 4,885,154, Cl. 424-10.000.

Cornell, John, to Medi-Tech International Corporation. Wound dressings in gelled paste form. 4,885,161, Cl. 424-78.000.

Cosson, Keith J. Stalk cutting apparatus. 4,884,391, Cl. 56-53.000.

Council, Buford W., Jr., to Citycrown, Inc. Method and apparatus for cutting an aspheric surface on a workpiece. 4,884,482, Cl. 82-1.110.

Coutts, Ian M.: *See*—
Thornley, David J.; Smith, Moira A.; Dale, Philip; Leask, Samuel H.; and Coutts, Ian M., 4,884,368, Cl. 49-276.000.

Coutures, Jean-Louis, to Thomson-CSF. Charge-reading device for linear photosensor with line structure anti-dazzle device. 4,885,626, Cl. 377-58.000.

Cox, Mary S. Protective garment. 4,884,295, Cl. 2-2.000.

Cox, Ned, to Texas Instruments Incorporated. Miniaturized fan for printed circuit boards. 4,885,488, Cl. 310-68.00R.

CP Packaging Inc.: *See*—
O'Meara, John R., 4,884,703, Cl. 215-6.000.

Crampton, Timothy P., to Applied Research & Technology, Inc. Unique computer power system with backup power. 4,885,521, Cl. 320-14.000.

Crawford, Carl R., to General Electric Company. Minimization of directed points generated in three-dimensional dividing cubes method. 4,885,688, Cl. 364-413.220.

Create System Co., Ltd.: *See*—
Matsumoto, Masatsugu, 4,884,984, Cl. 439-877.000.

Creech, Charles M., Jr. Meter reading aid. 4,884,871, Cl. 350-319.000.

Cregg, James M., to Phillips Petroleum Company. Genes from pichia histidine pathway and uses thereof. 4,885,242, Cl. 435-68.000.

Crinos Industria Farmacobiologica Spa.: *See*—
Gazzani, Giovanni, 4,885,169, Cl. 424-104.000.

Crippen, Warren S., to Digital Equipment Corporation. On-line filtration of potassium permanganate. 4,885,036, Cl. 134-13.000.

Crisci, Harry E., to Northern Engineering and Plastics Corp. Water bottle cap. 4,884,707, Cl. 215-256.000.

Crocker, Mary E.: *See*—
Cochran, Stuart A.; Benjamin, Earl J.; Crocker, Mary E.; Seidel, William C.; and Cipriano, Vicki L., 4,885,180, Cl. 426-241.000.

Croll, John, to Digital Equipment Corporation. Boot system for distributed digital data processing system. 4,885,770, Cl. 379-269.000.

Crooks, Lawrence E.: *See*—
Yao, Ching; Hale, James D.; Crooks, Lawrence E.; and Kaufman, Leon, 4,885,542, Cl. 324-313.000.

Csanak, George: *See*—
Moore, James E.; Kale, B. Michael; Csanak, George; and Luty, Fritz, 4,884,855, Cl. 350-1.100.

CSK Corporation: *See*—
Horie, Kiyoshi, 4,885,736, Cl. 369-275.000.

Cuellar, Richard E.: *See*—
Larkins, Brian; Cuellar, Richard E.; and Wallace John C., 4,885,357, Cl. 530-373.000.

Culbertson, Timothy D.: *See*—
McCormick, Peter E.; Culbertson, Timothy D.; and Autry, Walter D., Jr., 4,884,670, Cl. 192-56.00F.

Cullis, Pieter R.: *See*—
Bally, Marcel B.; Loughrey, Helen; and Cullis, Pieter R., 4,885,172, Cl. 424-417.000.

Cunningham, Howard G., Jr.: *See*—
Beck, Kent L.; and Cunningham, Howard G., Jr., 4,885,717, Cl. 364-900.000.

Curiger, Karl: *See*—
Gasser, Hermann; Curiger, Karl; and Rutz, Hans, 4,884,320, Cl. 19-106.00R.

Curletto, Giorgio F. Slender housing for electronic M.I.D.I. accordion. 4,884,488, Cl. 84-376.00R.

Currier, John K.: *See*—
Lavoie, Gerard H.; Miller, Charles W., Jr.; Currier, John K.; Saunders, Lionel F.; and Leary, Daniel J., 4,885,454, Cl. 219-390.000.

Currier, Joseph G.: *See*—
Powers, Richard G.; Currier, Joseph G.; and Zeets, Joseph S., 4,884,594, Cl. 137-625.480.

Curzon, Francis L.: *See*—
Whitehead, Lorne A.; Clark, Robert L.; and Curzon, Francis L., 4,885,783, Cl. 381-191.000.

Custin, James R., to GB Electrical, Inc. Shielded cable cutter with improved cable clamp. 4,884,339, Cl. 30-90.400.

Cutri, Joseph: *See*—
Goulet, Roger; Cutri, Joseph; and DeYulio, Joseph, 4,885,015, Cl. 55-497.000.

Cybex Corporation: *See*—
Asprey, Robert R.; and Shatas, Remigius G., 4,885,718, Cl. 364-900.000.

Cyron, Theodor, to Emitec Gesellschaft fur Emissionstechnologie mbH. Method of oxidation of the surface of a catalyst carrier body and a catalyst carrier body produced according to the method. 4,885,269, Cl. 502-439.000.

Czajkowski, Didier; Labarthe, Joel; and Bouyou, Bertrand, to Conception, Elaboration, Realisation D'Ensembles Electroniques et Mecaniques (C.E.R.E.M.). Process and machine for collecting of products, especially fruit, from the ground. 4,884,392, Cl. 56-13.100.

Daboub, Henry A. Singulator for document feeder. 4,884,796, Cl. 271-111.000.

Dacey, Ernest A., Jr., to Utica Enterprises, Inc. Apparatus for body panel attachment. 4,884,431, Cl. 72-334.000.

Daggett, Walter E.; and Zaracki, Stanley J., to Ford Motor Company. Four speed ratio automatic power transmission. 4,884,471, Cl. 74-758.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Hashimoto, Yutaka; Kamei, Masayuki; and Umaba, Toshihiko, 4,884,866, Cl. 350-96.340.
Tsuchiya, Kikuo; Araki, Shingo; Inagaki, Masaji; Kudoh, Yumi; and Kitao, Teijiro, 4,885,270, Cl. 503-209.000.

Dainippon Pharmaceutical Co., Ltd.: *See*—
Hashimoto, Masanori; Yamamoto, Takeshi; Kawachi, Toru; Kuwashima, Junji; and Kitaoka, Hirokazu, 4,885,168, Cl. 424-95.000.

Dainippon Screen Mfg., Co., Ltd.: *See*—
Uemura, Haruo, 4,884,869, Cl. 350-169.000.

Dakin, John P., to Plessey Overseas Limited. Optical fiber sensing systems. 4,885,462, Cl. 250-227.000.

Dale, Philip: *See*—
Thornley, David J.; Smith, Moira A.; Dale, Philip; Leask, Samuel H.; and Coutts, Ian M., 4,884,368, Cl. 49-276.000.

Dallas Semiconductor Corporation: *See*—
Little, Wendell L., 4,885,716, Cl. 364-786.000.

Dalrymple, Monte J., to Zilog, Inc. Serializer system with variable character length capabilities. 4,885,584, Cl. 341-101.000.

Damrath, Volker: *See*—
Lindner, Christian; Eichenauer, Herbert; Wittmann, Dieter; and Damrath, Volker, 4,885,209, Cl. 428-420.000.

Danforth, Richard L.; and Smith, Darlene G., to Shell Oil Company. Polyketone flame retardant composition. 4,885,318, Cl. 524-281.000.

Danforth, Richard L.; and Smith, Darlene G., to Shell Oil Company. Flame retardant compositions. 4,885,328, Cl. 525-424.000.

Daniels, Pamela M.: *See*—
Williams, Barry W.; and Daniels, Pamela M., 4,885,160, Cl. 424-72.000.

Danner, Bernard; and Schleusener, Eckart, to Sandoz Ltd. Water dispersible quaternized aminoamide-modified waxes useful as textile finishing agents. 4,885,325, Cl. 524-236.000.

Dapo, Roland F., to North American Philips Corporation. Electrolytic capacitor for use in a wide temperature range and high voltages. 4,885,660, Cl. 361-506.000.

Das, Shyam C., to Digital Equipment Corporation. Thin film head having a magneto-restrictive read element. 4,885,649, Cl. 360-113.000.

Datox Organisation D. Schweinsberg GmbH & Co. KG: *See*—
Schweinsberg, Dieter K. J., 4,884,885, Cl. 353-120.000.

Datta, Rathin, to Michigan Biotechnology Institute. Recovery and purification of lactate salts from whole fermentation broth by electrodialysis. 4,885,247, Cl. 435-139.000.

Davies, Roger W.: *See*—
Buxton, Franics P.; Gwynne, David I.; and Davies, Roger W., 4,885,249, Cl. 435-172.300.

Davis Aerospace Corp.: *See*—
Snead, Edwin de S., 4,884,769, Cl. 244-145.000.

Davis, Jerry E.: *See*—
Kolodesh, Michael S.; Cash, Walter, Jr.; Davis, Jerry E.; Gosselin, Peter G.; Kock, Ronald W.; Pierson, Bruce A.; Reiboldt, H. Norman; Sabatelli, David A.; and Toms, Douglas, 4,885,182, Cl. 426-482.000.

Davis, Shannon: *See*—
Drago, Russell S.; and Davis, Shannon, 4,885,377, Cl. 556-136.000.

Dayco Products, Inc.: *See*—
Miranti, Joseph P., Jr., 4,884,998, Cl. 474-205.000.

Debetencourt, Jean, to Lynes Holding S.A. Pourer plug for a receptacle. 4,884,705, Cl. 215-250.000.

DeBlock, David A.; and Artwick, Kert E., to ODL, Incorporated. Sun porch. 4,884,376, Cl. 52-90.000.

De Deken, Jacques C.: *See*—
Newman, Stanley F.; De Deken, Jacques C.; and Cook, Michael L., 4,885,399, Cl. 568-410.000.

Deere & Company: *See*—
Hall, James W.; Popelier, Maurice A.; Klimmer, Josef W.; West, Neil L.; and Peters, Loren W., 4,884,994, Cl. 460-66.000.

Deering, Michael F., to Schlumberger Systems, Inc. 3-D graphics display system using triangle processor pipeline. 4,885,703, Cl. 364-522.000.

De Freitas, Anthony S. W.; McCulloch, Archibald W.; and McInnes, Alister G., to Canadian Patents and Development Limited/Societe Canadienne des Brevets et D'Exploitation Limited. Recovery and purification of silica. 4,885,149, Cl. 423-339.000.

Degnan, Thomas F., Jr.; and Dessau, Ralph M., to Mobil Oil Corporation. Operation of an internal combustion engine with a pre-engine reformer. 4,884,531, Cl. 123-3.000.

Degtev, Evgeny I.: *See*—
Fedorov, Svyatoslav N.; Soloviev, Sergei A.; Degtev, Evgeny I.; Ivashina, Albina I.; and Karavaev, Alexandr A., 4,884,569, Cl. 128-305.000.

Delagi, Richard G.: *See*—
Trenkler, George; and Delagi, Richard G., 4,885,214, Cl. 428-614.000.

Delaware Capital Formation, Inc.: *See*—
Kaiser, Danny K., 4,884,452, Cl. 73-730.000.

Delco Electronics Corporation: *See*—
Hersberger, Jill G.; Bell, Myron H.; Harding, Robert L.; and Spadafora, Peter J., 4,885,710, Cl. 364-565.000.
Yoder, Douglas J.; Brown, Ronald E.; Stevenson, Paul E.; Hornback, Donald L.; and Leisure, Ronald K., 4,885,621, Cl. 357-26.000.

DeLigt, John: *See*—
Beran, Robert L.; and DeLigt, John, 4,885,060, Cl. 162-344.000.

Delta Medical Systems, Inc.: *See*—
Nix, Frank H., Jr., 4,884,296, Cl. 2-011.000.

Demco Bingo Inc.: *See*—
Kondziolka, Stanley; and Klein, Henry, 4,885,700, Cl. 364-519.000.

den Hartog, Huibert W.; and van Perlstein, Erik B., to Hoogovens, Groep B.V. Method for the manufacture of formable steel strip. 4,885,041, Cl. 148-2.000.

Denman, Stephen A.; and Taylor, Garthwood R., to Deuer Manufac:uring Inc. Apparatus for securing a spare tire on a vehicle. 4,884,785, Cl. 254-389.000.

Dennis, Kent S., to Dow Chemical Company, The. Preparation of triblock copolymers. 4,885,343, Cl. 525-280.000.

Dennison Manufacturing Company: *See*—
Leahy, David J., 4,884,718, Cl. 220-339.000.

Dereco Dieselmotoren Forschungs-und Entwick-lungs-AG: *See*—
Mathis, Christian, 4,884,545, Cl. 123-447.000.

DeRees, Delbert D., to Chrysler Motors Corporation. Seat tilt mechanism. 4,884,843, Cl. 297-331.000.

DeSmet, Eric, to View-Master Ideal Group, Inc. Interactive talking book and audio player assembly. 4,884,974, Cl. 434-317.000.

Desmurs, Jean-Roger: *See*—
Ratton, Serge; and Desmurs, Jean-Roger, 4,885,408, Cl. 568-779.000.

Dessau, Ralph M.: *See*—
Degnan, Thomas F., Jr.; and Dessau, Ralph M., 4,884,531, Cl. 123-3.000.

De Thomas, Waldo, to GAF Corporation. Hydrogenation catalyst. 4,885,410, Cl. 568-861.000.

De Thomas, Waldo; and Taylor, Paul D., to GAF Corporation. Hydrogenation process for converting lactones to diols. 4,885,411, Cl. 568-864.000.

Detroit Marine Engineering Corporation: *See*—
Wrigley, R. Alexander, 4,884,469, Cl. 74-552.000.

Deuer Manufacturing Inc.: *See*—
Denman, Stephen A.; and Taylor, Garthwood R., 4,884,785, Cl. 254-389.000.

Deutsche-Forschungs- und Versuchsanstalt: *See*—
Butefisch, Karl-Aloys, 4,884,888, Cl. 356-373.000.

Devilleger, Denis: *See*—
Le Gac, Jean-Yves; Devilleger, Denis; and Majewski, Philippe, 4,884,633, Cl. 166-75.100.

Devorak, Dora. Puzzle apparatus. 4,884,811, Cl. 273-157.00A.

de Waal, Jannetje A.: *See*—
Vinegar, Harold J.; Wellington, Scott L.; and de Waal, Jannetje A., 4,884,455, Cl. 73-798.000.

Dewert, Heribert: *See*—
Jorzyk, Sigurd; Scholl, Gerhard; Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,885,011, Cl. 55-242.000.

DeYulio, Joseph: *See*—
Goulet, Roger; Cutri, Joseph; and DeYulio, Joseph, 4,885,015, Cl. 55-497.000.

De31ilbiss Company, The: *See*—
Plummer, Raymond G., 4,884,752, Cl. 239-691.000.

Dhyanchand, John J.: *See*—
Shekhawat, Sampat S.; Dhyanchand, John J.; and Horowy, John, 4,885,486, Cl. 307-570.000.

Diaz-Infante, Javier: *See*—
Ventura, Leon P.; and Diaz-Infante, Javier, 4,884,388, Cl. 53-537.000.

DiChiara, Joseph G.: *See*—
Webster, Raymond J., Jr.; and DiChiara, Joseph G., 4,885,679, Cl. 364-200.000.

Didebulidze, Alexandr K.: *See*—
Ksovreli, Robinzon I.; Didebulidze, Alexandr K.; Kochiev, Valery K.; and Gasseev, Amiran F., 4,885,487, Cl. 310-36.000.

Diebold Incorporated: *See*—
Graef, Harry T.; and Newton, Kevin H., 4,884,679, Cl. 198-718.000.

Dietrich, Anton: *See*—
Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.

Dietrich, Otto E. Collet chuck. 4,884,821, Cl. 279-1.00A.

Digital Equipment Corporation: *See*—
Crippen, Warren S., 4,885,036, Cl. 134-13.000.
Croll, John, 4,885,770, Cl. 379-269.000.
Das, Shyam C., 4,885,649, Cl. 360-113.000.

Dimed Inc.: *See*—
Elliott, Clyde D.; and Cohen, Donald M., 4,884,567, Cl. 128-303.00R.

Dinatale, Ernest L.; and Roller, George J., to Xerox Corporation. Duplex document handler. 4,884,794, Cl. 271-3.000.

Dirlikov, Stoil K.: *See*—
Inbasekaran, Muthiah N.; and Dirlikov, Stoil K., 4,885,403, Cl. 568-631.000.

Dittert, Lewis W.: *See*—
Hussain, Anwar A.; Dittert, Lewis W.; and Foster, Thomas S., 4,885,287, Cl. 514-159.000.

Dittmer, Gonde: *See*—
Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.

Divakaruni, Renuka S.: *See*—
Anderson, Herbert R., Jr.; Divakaruni, Renuka S.; Dynys, Joseph M.; Kandetzke, Steven M.; Kirby, Daniel P.; Master, Raj N.; and Casey, Jon A., 4,885,038, Cl. 156-89.000.

Dix, Willard A., to Telephone and Telegraph Company; and AT&T Information Systems Inc. Cantilever spring switch having multiple fulcrums. 4,885,435, Cl. 200-1.00B.

Dixon, John; and Ince, Francis, to Fisons plc. 3,4-Dihydroxyphenylethylamine derivatives and their use. 4,885,313, Cl. 514-620.000.

DLI Corporation: *See*—
Nichol, Robert E.; Grant, Robert B.; and Faddis, Charles T., 4,885,707, Cl. 364-551.010.

Dobbeler, Peter, to Camloc GmbH. Panel fastener with friction cones. 4,884,930, Cl. 411-6.000.

Dolson, Mark G.: *See*—
Lee, Len F.; and Dolson, Mark G., 4,885,026, Cl. 71-94.000.

DOM Sicherheitstechnik GmbH & Co KG: *See*—
Wolter, Heinz, 4,884,422, Cl. 70-165.000.

Donavich, John X., to Transamerica Interway, Inc. Sliding rib siding for refrigerated trailers and the like. 4,884,496, Cl. 98-6.000.

Dore, James E.: *See*—
Brockmeyer, Jerry W.; Aubrey, Leonard S.; and Dore, James E., 4,885,263, Cl. 501-81.000.

Dornhagen, Horst; Hammer, Hartmut; Haas, Bernd; and Meisenburg, Ewald. Process for the production of pure dimethylether and a catalyst used in the process. 4,885,405, Cl. 568-698.000.

Dornier System GmbH: *See*—
Lork, Wolfram, 4,885,137, Cl. 422-140.000.

Dosmann, Thomas R., to Continental Industries, Inc. One piece air diffuser. 4,884,497, Cl. 98-40.130.

Doty, Fred P., to Santa Barbara Research Center. In-situ generation of volatile compounds for chemical vapor deposition. 4,885,067, Cl. 204-157.600.

Douesnel, Xavier: *See*—
Toupin, Joseph; and Douesnel, Xavier, 4,884,897, Cl. 374-160.000.

Dougherty, James A.; and Vara, Fulvio J., to GAF Corporation. Solvent resistant irradiation curable coatings. 4,885,319, Cl. 522-31.000.

Doughty, Haydn C., to Westinghouse Electric Corp. Removal of obstructions in thimbles of nuclear power reactors. 4,885,124, Cl. 376-260.000.

Douskalis, William, to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Data communication arrangement with embedded matrix switch. 4,885,741, Cl. 370-67.000.

Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel, N.V.: *See*—
Kaper, Louris, 4,885,181, Cl. 426-422.000.

Dow Chemical Company, The: *See*—
Brewster, Steven L., 4,885,150, Cl. 423-366.000.
Dennis, Kent S., 4,885,343, Cl. 525-280.000.
Inbasekaran, Muthiah N.; and Dirlikov, Stoil K., 4,885,403, Cl. 568-631.000.
Pawloski, Chester E., 4,885,381, Cl. 558-155.000.
Pham, Tu-Anh; and Lancaster, Gerald M., 4,885,315, Cl. 521-50.500.
Traugott, Thomas D.; Moore, Eugene R.; and Malanga, Michael T., 4,885,339, Cl. 525-132.000.
Wessling, Ritchie A.; Schmidt, Donald L.; and Aikawa, Kiyoshi I., 4,885,355, Cl. 528-99.000.

DowBrands Inc.: *See*—
Erickson, Laurence R., 4,885,352, Cl. 526-348.100.

Dowd, Edward J., to ARI Technologies, Inc. Catalyst composition and method. 4,885,268, Cl. 502-163.000.

Doyle, Lorin G., to Flint & Walling, Inc. Nozzle/venturi with pressure differentiating bypass. 4,885,084, Cl. 210-132.000.

Drabing, Walter; and Fiedler, Kurt, to WEGU Gummi- und Kunststoffwerke Walter Drabing K.G. Mount for engine, gearbox or similar parts of a motor vehicle. 4,884,779, Cl. 248-610.000.

Drago, Russell S.; and Davis, Shannon, to University of Florida. Olefin and alkane oxidations, ruthenium carboxylate catalyst therefor and method of preparation thereof. 4,885,377, Cl. 556-136.000.

Draper, Daniel S.: *See*—
Bell, Marshall J., Jr.; and Draper, Daniel S., 4,885,547, Cl. 330-254.000.

Drehkoff, William D.: *See*—
Soucie, William G.; Chen, Wen-Sherng; Witte, Vernon C.; Henry, George A.; and Drehkoff, William D., 4,885,179, Cl. 426-104.000.

Dreier, Ernst, to F. Gegauf AG Bernina-Nahmaschinenfabrik. Bobbin case holder with adjustable thread tensioning device. 4,884,519, Cl. 112-229.000.

Drewry, Hugh R., Jr.: *See*—
Neihoff, Randall L.; and Drewry, Hugh R., Jr., 4,884,355, Cl. 43-17.000.

DSC Communications Corporation: *See*—
Read, Edgar L.; Grant, Elwyn E.; Keto, Gary A.; Lin, Sharlene C.; Morgan, James D.; Nimon, Robert E.; Oldham, Oliver G.; Adams, Allen R., Jr.; and Salmones, Jose A., 4,885,739, Cl. 370-58.100.

DSH: *See*—
Gagnon, Laurent, 4,884,371, Cl. 49-501.000.

Dual Lite, Inc.: *See*—
Johnstone, Robert M.; and Wegrzyn, Joseph S., 4,885,474, Cl. 307-66.000.

Duber, Ernst O.: *See*—
Brown, James P.; Duber, Ernst O.; and Loenders, Mark, 4,885,348, Cl. 525-458.000.

Dueme, Philippe: *See*—
Ouvrard, Pierre-Louis; and Dueme, Philippe, 4,885,562, Cl. 333-139.000.

Dugge, Richard H., to ACF Industries, Incorporated. Hard gasket for retrofit installation on hopper outlet/hopper gasket outlet. 4,884,723, Cl. 222-542.000.

Duke, John H. Rowing machine. 4,884,800, Cl. 272-72.000.

Dulevo S.p.A.: *See*—
Zoni, Sergio, 4,884,313, Cl. 15-340.300.

Dunnavant, William R.: *See*—
Jhaveri, Satish S.; Dunnavant, William R.; and Langer, Heimo J., 4,884,620, Cl. 164-15.000.

Du Pont de Nemours, E. I., and Company: *See*—
Eveleigh, John William d.; and Kobos, Robert K., 4,885,250, Cl. 435-181.000.
Herkes, Frank E., 4,885,391, Cl. 564-491.000.
Hubner, Romeo J., 4,885,697, Cl. 364-497.000.
Iqbal, Tahir; Cain, John H., Jr.; and Slosky, Jack J., 4,885,100, Cl. 252-1.000.
Mader, Frederick W., 4,885,416, Cl. 570-170.000.
Putzig, Donald E.; and Smeltz, Kenneth C., 4,885,103, Cl. 252-8.551.

Dupuis, John R. Adjustable appliance covering. 4,884,686, Cl. 206-320.000.

Durantet, Bernard: *See*—
Barriquand, Bernard; Villard, Francois; and Durantet, Bernard, 4,884,418, Cl. 68-150.000.

Durigon, Duilio. Transmission control locking device. 4,884,654, Cl. 180-287.000.

Duruisseau, Bernard. Screw with recirculated satellite rollers. 4,884,466, Cl. 74-424.80C.

Dutton-Lainson Corporation: *See*—
Barkouskie, Ronnie, 4,884,729, Cl. 224-42.210.

Dyckerhoff & Widmann AG: *See*—
Bomhard, Helmut; Fischer, Ernst; and Rudat, Dieter, 4,884,711, Cl. 220-5.00A.

Dykmans, Max J. Ripple-free flow, accurate mix, and automated spray system. 4,884,747, Cl. 239-61.000.

Dyll, Louis M.: *See*—
Osther, Kurt B.; and Dyll, Louis M., 4,885,235, Cl. 435-5.000.

Dynys, Joseph M.: *See*—
Anderson, Herbert R., Jr.; Divakaruni, Renuka S.; Dynys, Joseph M.; Kandetzke, Steven M.; Kirby, Daniel P.; Master, Raj N.; and Casey, Jon A., 4,885,038, Cl. 156-89.000.

Dyrkorn, Arnfinn, to Brodr. Brunvoll Motorfabrikk A/S. Elastically supported thruster structure. 4,884,985, Cl. 440-52.000.

E. R. Squibb & Sons, Inc.: *See*—
Ryono, Denis E.; and Weller, Harold N., III, 4,885,292, Cl. 514-211.000.
Thottathil, John K., 4,885,364, Cl. 540-523.000.
Tweedle, Michael F.; Gaughan, Glen T.; and Hagan, James T., 4,885,363, Cl. 540-465.000.

Eakin, Robert R. Drive units for air driven vehicles. 4,884,949, Cl. 416-170.00R.

Eastman Christensen Company: *See*—
Smith, Redd H.; and Cooley, Craig H., 4,884,477, Cl. 76-108.00A.

Eastman Kodak Company: *See*—
Chapman, Derek D.; and Weber, Helmut, 4,885,272, Cl. 503-227.000.
Choi, King F., 4,885,705, Cl. 364-525.000.
Cichanowicz, Peggy W.; and Belly, Robert T., 4,885,239, Cl. 435-34.000.
Gunther, Wolfgang H. H.; and Sauter, Frederick J., 4,885,366, Cl. 544-300.000.
Hatwar, Tukaram K., 4,885,134, Cl. 420-416.000.
Messing, Calvin R., 4,885,233, Cl. 430-608.000.
Rule, Mark, 4,885,423, Cl. 585-427.000.
Sullivan, James R., 4,885,636, Cl. 358-133.000.
Tang, Ching W.; and VanSlyke, Steven A., 4,885,211, Cl. 428-457.000.
Tschang, Pin S.; Pham, Hieu T.; and Kieffer, Kenneth D., 4,885,597, Cl. 364-519.000.
Wu, Annie L., 4,885,240, Cl. 435-34.000.
Zengerle, Paul L., 4,885,234, Cl. 430-546.000.

Ebara Corporation: *See*—
Hiyama, Hirokuni; Watanabe, Katsuhide; Nakajima, Atsushi; and Murakami, Chikara, 4,885,491, Cl. 310-90.500.

Ebara Research Co., Ltd.: *See*—
Hiyama, Hirokuni; Watanabe, Katsuhide; Nakajima, Atsushi; and Murakami, Chikara, 4,885,491, Cl. 310-90.500.

Eber, David H.; and Ring, H. Kenneth, to American Standard Inc. Electric motor driven air valve. 4,884,590, Cl. 137-1.000.

Eberbach, Steven J., to Krausse, Howard. Single and double symmetric loudspeaker driver configurations. 4,885,782, Cl. 381-186.000.

Eberhart, Suzanne T.: *See*—
Band, Elliot I.; and Eberhart, Suzanne T., 4,885,378, Cl. 556-426.000.

Eck, Henry H.: *See*—
Kane, Mark E.; Shockley, James F.; and Eck, Henry H., 4,885,689, Cl. 364-424.010.

Eck, Robert E.; and Joyce, Richard J., to Santa Barbara Research Center. Direct measurement of photodiode impedance using electron beam probing. 4,885,534, Cl. 324-158.00D.

Eckhart, Manfred: *See*—
Ahlf, Heinz-Jurgen; Guhne, Gieland; and Eckhart, Manfred, 4,885,013, Cl. 55-367.000.

Economic Combustion Systems Limited: *See*—
Bird, John H.; and Waugh, Robin K., 4,884,550, Cl. 123-587.000.

Edelstein, William A.: *See*—
Roemer, Peter B.; Bottomley, Paul A.; and Edelstein, William A., 4,885,539, Cl. 324-318.000.

Edgar, Kevin J.: *See*—
Steinmetz, Guy R.; Edgar, Kevin J.; and Falling, Stephen N., 4,885,384, Cl. 562-406.000.

Edgar, Roger F.; and Hindle, Peter H., to Infrared Engineering Limited. Method and apparatus for sensing or determining one or more properties or the identity of a sample. 4,885,709, Cl. 364-563.000.

Edward, Brian J.; and Wanuga, Stephen, to General Electric Company. Optical distribution of transmitter signals and antenna returns in a phased array radar system. 4,885,589, Cl. 342-175.000.

Edwards, Harper, McNew & Company: *See*—
Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., 4,884,852, Cl. 305-35.0EB.

Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., to Edwards, Harper, McNew & Company. Double V-shaped endless track drive system. 4,884,852, Cl. 305-35.0EB.

Edwards, Nathen P., to International Business Machines Corporation. Method and structure for reducing resistance in integrated circuits. 4,885,627, Cl. 357-59.000.

Egawa, Akira, to Fanuc Ltd. High frequency discharge excitation laser device. 4,885,754, Cl. 372-86.000.

Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoaki; and Machida, Hironobu, to Kabushiki Kaisha Toshiba. Recording apparatus. 4,885,596, Cl. 346-157.000.

Eguchi, Tatsuya, to Minolta Camera Kabushiki Kaisha. Recording apparatus with position dependent pulse modulation. 4,885,594, Cl. 346-108.000.

Ehara, Katsuo. Odor identifying apparatus and method. 4,884,435, Cl. 72-23.000.

Ehnert, Richard E. Vacuum cleaner having circuitous flow. 4,884,315, Cl. 15-346.000.

Ehrlinger, Friedrich, to Zahnradfabrik Friedrichshafen AG. Motor-vehicle antirunaway system. 4,884,669, Cl. 192-4.00B.

Eichenauer, Herbert; Pischtschan, Alfred; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Process for the preparation of thermoplastic moulding compositions. 4,885,337, Cl. 525-75.000.

Eichenauer, Herbert: *See*—
Lindner, Christian; Eichenauer, Herbert; Wittmann, Dieter; and Damrath, Volker, 4,885,209, Cl. 428-420.000.

Eisenstein, Gabe L.; Grodd, Laurence W.; McClellan, Paul J.; Miller, Robert M.; Patton, Charles M.; and Wickes, William C., to Hewlett-Packard Company. Calculator having a user-accessible object stack for the uniform application of mathematical functions and logical operations to a multiplicity of object types. 4,885,714, Cl. 364-709.010.

Ejiri, Kiyomi: *See—*
Araki, Hiroaki; Ejiri, Kiyomi; and Ohya, Takao, 4,885,208, Cl. 428-403.000.

EL-O-MATIC-USA, Inc.: *See—*
Groeneveld, Floris J., 4,884,495, Cl. 92-130.00C.

Elba-Ordner-Fabrik Kraut & Meienborn GmbH & Co.: *See—*
Behrens, Dietmar; Hoog, Waldemar; and Zimmermann, Rudolf, 4,884,691, Cl. 206-444.000.

Electric Power Research Institute: *See—*
Temple, Victor A. K., 4,885,630, Cl. 357-71.000.

Electro Erg Limited: *See—*
Szabo, Leslie I., 4,885,526, Cl. 322-66.000.

Electronic Warfare Associates, Inc.: *See—*
Guerreri, Carl N., 4,884,506, Cl. 102-200.000.

Electronique Serge Dassault: *See—*
Ouvrard, Pierre-Louis; and Dueme, Philippe, 4,885,562, Cl. 333-139.000.

Elektroschmelzwerk Kempten GmbH: *See—*
Sindlhauser, Peter; Hunold, Klaus; and Lipp, Alfred, 4,885,264, Cl. 501-87.000.

Elf France: *See—*
Trema, Daniel, 4,884,663, Cl. 188-18.00A.

Elf, Juha: *See—*
Mattila, Timo; and Elf, Juha, 4,885,461, Cl. 250-223.00B.

Eli Lilly and Company: *See—*
Hamill, Robert L.; and Yao, Raymond C., 4,885,170, Cl. 424-117.000.
Huber, Floyd M.; Pieper, Richard L.; and Tietz, Anthony J., 4,885,243, Cl. 435-71.300.
Ingolia, Thomas D.; Queener, Stephen W.; Samson, Suellen M.; Skatrud, Paul L.; and Godfrey, Otis W., 4,885,251, Cl. 435-183.000.
Ingolia, Thomas D.; Queener, Stephen W.; Skatrud, Paul L.; and Wiegel, Barbara J., 4,885,252, Cl. 435-252.300.
McDonald, John H., III, 4,885,291, Cl. 514-210.000.
Morin, John M., Jr.; and Vladuchick, William C., 4,885,362, Cl. 540-364.000.
Robison, Robert L., 4,885,275, Cl. 514-8.000.
Shaar, Carl J.; and Smith, Michele C., 4,885,163, Cl. 514-2.000.

Elkins, William, to Life Support Systems, Inc. Bedding system with selective heating and cooling. 4,884,304, Cl. 5-421.000.

Ellers, Berne F.: *See—*
Bither, Peter G.; Ellers, Berne F.; and Engle, Edward J., III, 4,885,204, Cl. 428-284.000.

Ellingsen, Olav, to Industrikontakt Ing. O. Ellingsen & Co. Process for increasing the degree of oil extraction. 4,884,634, Cl. 166-248.000.

Elliott, Clyde D.; and Cohen, Donald M., to Dimed Inc.; and Siemens-Pacesetter, Inc. Method for transvenous implantation of objects into the pericardial space of patients. 4,884,567, Cl. 128-303.00R.

Ellis, Roger H.; Walton, A. Christian; and Tomita, Akira, to Raychem Corp. Pin and socket fiber optic connector. 4,884,864, Cl. 350-96.210.

Elrod, Jimmie L., to Tennessee Valley Authority. Particulate urea with clay incorporated for hardness and/or gelling. 4,885,021, Cl. 71-28.000.

El-Sadi, Ashraf I., to Unisys Corporation. Techniques for disk servo track following. 4,885,516, Cl. 318-615.000.

Ely, Gary W., to Coe Manufacturing Company, The. Lathe charger centering with log scanning during rotation and lateral movement of spindles. 4,884,605, Cl. 144-357.000.

Embach, James T., to General Motors Corporation. Touchscreen CRT with tactile feedback. 4,885,565, Cl. 340-407.000.

Emerson Electric Co.: *See—*
Johnson, Harold R., III, 4,884,916, Cl. 403-370.000.

Emitec Gesellschaft fur Emissionstechnologie mbH: *See—*
Cyron, Theodor, 4,885,269, Cl. 502-439.000.

Emon, Randall S. Auxiliary door lock for a powered garage door. 4,884,831, Cl. 292-38.000.

Ems-Inventa AG: *See—*
Annighofer, Frank; Schneider, Ewald; and Schultze, Hans-Joachim, 4,885,331, Cl. 524-539.000.

Emura, Tatuo; and Ohba, Kiyoshi, to Kabushiki Kaisha Hokkaido Nissin. Method of making a soybean protein food product. 4,885,178, Cl. 426-46.000.

En-Jian, Chen; Zhaorong, Lin; and Ly-ying, Chen. Heat pipe employing hydrogen oxidation means. 4,884,628, Cl. 165-104.270.

Endo, Mitsuhiro, to Tokico Ltd. Pneumatic booster. 4,884,491, Cl. 91-369.200.

Engelson, Erik T., to Target Therapeutics. Catheter guide wire. 4,884,579, Cl. 128-772.000.

Engle, Edward J., III: *See—*
Bither, Peter G.; Ellers, Berne F.; and Engle, Edward J., III, 4,885,204, Cl. 428-284.000.

Enoki, Shigekazu; Sawayama, Noboru; Katoh, Shunji; and Kimura, Noriyuki, to Ricoh Company, Ltd. Method and apparatus for developing electrostatic latent image. 4,885,223, Cl. 430-122.000.

Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, to Sumitomo Chemical Co., Ltd. Benzoxazinyl-triazole oxides and use. 4,885,024, Cl. 71-92.000.

EOA Systems, Inc.: *See—*
McCormick, Peter E.; Culbertson, Timothy D.; and Autry, Walter D., Jr., 4,884,670, Cl. 192-56.00F.

Epicor Technology, Inc.: *See—*
Choinski, Edward J., 4,884,337, Cl. 29-846.000.

Eppig, Christopher P.; Paspek, Stephen C.; and Stalzer, Richard B., to Standard Oil Company, The. Process for separating organic material from particulate solids. 4,885,079, Cl. 208-13.000.

Equus Marketing Corp.: *See—*
Tobler, Peter, 4,884,846, Cl. 297-411.000.

ERA Patents Limited: *See—*
Aitchison, Colin S., 4,885,483, Cl. 307-492.000.

Ergenics, Inc.: *See—*
Golben, Peter M., 4,884,953, Cl. 417-379.000.

Erickson, Laurence R., to DowBrands Inc. Transparent plastic film comprising low density polyethylene. 4,885,352, Cl. 526-348.100.

Erickson, William R.; Stain, Donald B.; and Wilson, James D., to Phosphate Engineering & Construction Co., Inc. Production of monobasic potassium phosphate with low chloride content from potassium chloride and phosphoric acid produced from the commercial wet process. 4,885,148, Cl. 423-309.000.

Erico International Corporation: *See—*
Amos, Michael D.; Kovarik, David P.; and Kub, George F., Jr., 4,885,452, Cl. 219-130.400.

Erk, Peter: *See—*
Huenig, Siegfried; Aumueller, Alexander; and Erk, Peter, 4,885,368, Cl. 544-347.000.

Ermilov, Nikolai P.: *See—*
Fadeev, Petr Y.; Fadeev, Vladimir Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; and Ermilov, Nikolai P., 4,884,642, Cl. 173-139.000.

Esu-Oh Giken Co., Ltd.: *See—*
Ohkubo, Takemi, 4,885,037, Cl. 156-57.000.

Ethicon, Inc.: *See—*
Roshdy, Constance E.; Cerwin, Robert J.; and Alpern, Marvin, 4,884,681, Cl. 206-63.300.

Ethyl Petroleum Additives, Inc.: *See—*
Lam, William Y., 4,885,365, Cl. 544-161.000.

Eto, Tooru: *See—*
Nakata, Tetsuro; Sato, Ichitaro; and Eto, Tooru, 4,885,639, Cl. 358-167.000.

Etoh, Hiroyuki: *See—*
Furukawa, Seijiro; Etoh, Hiroyuki; Ishizaka, Akitoshi; and Shimada, Toshikazu, 4,885,614, Cl. 357-16.000.

Evans, Elizabeth L.; Gonchoroff, Nick J.; Greipp, Philip R.; Houck, David W.; Katzmann, Jerry A.; Kyle, Robert A.; and Loken, Michael R., to Becton, Dickinson and Company. Detection of cellular DNA. 4,885,237, Cl. 435-6.000.

Evans, Richard A.: *See—*
McCanny, John V.; Evans, Richard A.; and McWhirter, John G., 4,885,715, Cl. 364-728.010.

Eveleigh, John William d.; and Kobos, Robert K., to Du Pont de Nemours, E. I., and Company. Enzyme immobilization and bioaffinity separations with perfluorocarbon polymer-based supports. 4,885,250, Cl. 435-181.000.

Ewards, Christopher J.: *See—*
Burnham, Audrey R.; Ewards, Christopher J.; and Munn, Roger E., 4,884,828, Cl. 283-89.000.

Exxon Research and Engineering Company: *See—*
Black, Laura E., 4,885,096, Cl. 210-640.000.

EyeTech AG: *See—*
Krumeich, Jorg H.; and Quast, Norbert, 4,884,570, Cl. 128-305.000.

F. Gegauf AG Bernina-Nahmaschinenfabrik: *See—*
Dreier, Ernst, 4,884,519, Cl. 112-229.000.

Fa. Rohren- und Pumpenwerk Rudolf Bauer Aktiengesellschaft: *See—*
Ruprechter, Adam, 4,884,749, Cl. 239-280.500.

Faddis, Charles T.: *See—*
Nichol, Robert E.; Grant, Robert B.; and Faddis, Charles T., 4,885,707, Cl. 364-551.010.

Fadeev, Petr Y.; Fadeev, Vladimir Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; and Ermilov, Nikolai P., to Institut Gidrokinamiki Im, Lavrentieva. Percussive action machine. 4,884,642, Cl. 173-139.000.

Fadeev, Vladimir Y.: *See—*
Fadeev, Petr Y.; Fadeev, Vladimir Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; and Ermilov, Nikolai P., 4,884,642, Cl. 173-139.000.

Falconnet, laude, to T.I.R.U. - Traitement Industriel Des Residus Urbains. Furnance hearth ashbox with extractor chamber that is easy to unjam. 4,884,515, Cl. 110-171.000.

Falling, Stephen N.: *See—*
Steinmetz, Guy R.; Edgar, Kevin J.; and Falling, Stephen N., 4,885,384, Cl. 562-406.000.

Fan, John C. C.; Zavracky, Paul M.; Narayan, Jagdish; Allen, Lisa P.; and Vu, Duy-Phach, to Kopin Corporation. Zone-melting recrystallization process. 4,885,052, Cl. 156-620.700.

Fancher, Ricky L., to Hurd Lock and Manufacturing Co., Inc. Vehicle lock assembly operable with transmission shifter and method. 4,884,423, Cl. 70-248.000.

Fanuc Ltd.: *See—*
Egawa, Akira, 4,885,754, Cl. 372-86.000.
Kurakake, Mitsuo; and Sakamoto, Keiji, 4,885,515, Cl. 318-567.000.

Farb, Thomas F. Method and device for selecting the appropriate contrast grade photographic for printing a black and white transparency. 4,885,607, Cl. 355-71.000.

Farina, Joseph P., to United Technologies Corporation. Precision 50 percent duty cycle controller. 4,885,475, Cl. 307-261.000.

Faris, Aziz I.; and Robertson, Perry J., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Source follower field-effect logic gate (SFFL) suitable for III-V technologies. 4,885,480, Cl. 307-448.000.

Farmer, James M.: *See—*
Read, Randol R.; Warmack, Ralph E.; Farmer, James M.; Henshaw, Jerry D.; and Marshall, Connie T., 4,885,724, Cl. 367-77.000.

Farrow, John F.; and Schulz, David W., to Medar, Inc. Automatic stepper for resistance welding. 4,885,451, Cl. 219-110.000.

FasTest, Inc.: *See—*
Meisinger, Stanlee W., 4,884,830, Cl. 285-94.000.

Fedorov, Svyatoslav N.; Soloviev, Sergei A.; Degtev, Evgeny I.; Ivashina, Albina I.; and Karavaev, Alexandr A., to Mezhotraslevoi Nauchno-tekhnichesky Komplex "Mikrokhirurgia Glaza". Device for ophthalmologic operations. 4,884,569, Cl. 128-305.000.

Fehn, Norbert: *See—*
Strenzke, Hilmar; and Fehn, Norbert, 4,884,402, Cl. 60-426.000.

Feldkamp, Valerie K. Shoulder pad for string instruments of the violin and viola type. 4,884,487, Cl. 84-280.000.

Fenwick, Chad. Exercise apparatus. 4,884,804, Cl. 272-145.000.

Fergason, James L., to Manchester R & D Partnership. Encapsulated liquid crystal material, apparatus and method having interconnected capsules. 4,884,873, Cl. 350-334.000.

Fergason, James L., to Manchester R & D Partnership. Liquid crystal temperature sensor and materials utilizing microencapsulated liquid crystal. 4,884,877, Cl. 350-351.000.

Ferk, Don L.; Schmelzer, Eugene; and Haun, Edward C., to UOP. Effluent separation method for aromatic hydrocarbon alkylation process. 4,885,424, Cl. 585-450.000.

Ferrer, Enrique, to Motorola, Inc. Signal input to differential output amplifier. 4,885,550, Cl. 330-301.000.

Ferris, John. Method and apparatus for cut flower storage and display. 4,884,364, Cl. 47-41.010.

Ferris Mfg. Corp.: *See—*
Sessions, Robert W., 4,884,563, Cl. 128-155.000.

Fey, Edward G.: *See—*
Penman, Sheldon; and Fey, Edward G., 4,885,236, Cl. 435-6.000.

Fiaschetti, Mary G. Dermal cosmetic composition and applications therefor. 4,885,157, Cl. 424-59.000.

Fiedler, Kurt: *See—*
Drabing, Walter; and Fiedler, Kurt, 4,884,779, Cl. 248-610.000.

Filipowski, Merle M. Combination refrigerator oven. 4,884,626, Cl. 165-12.000.

Finkel, A. Milton; and Bunka, Stephan F., to McGoldrick, Dennis E., Trustee. Cage with floating nut assembly. 4,884,420, Cl. 70-58.000.

Finkelstein, Sarah. Body supporting chair. 4,884,842, Cl. 297-331.000.

Fischer, Ernst: *See—*
Bomhard, Helmut; Fischer, Ernst; and Rudat, Dieter, 4,884,711, Cl. 220-5.00A.

Fischer, Karl W., Jr. Adjustable roof bracket. 4,884,775, Cl. 248-237.000.

Fischer, Reiner: *See—*
Marhold, Albrecht; and Fischer, Reiner, 4,885,388, Cl. 564-417.000.

Fisher, Frank N.: *See—*
Nachtigall, Ronnie; and Fisher, Frank N., 4,884,928, Cl. 410-103.000.

Fisons plc: *See—*
Dixon, John; and Ince, Francis, 4,885,313, Cl. 514-620.000.

Fjeldsted, John: *See—*
Hansen, Stuart; Fjeldsted, John; and Broadbent, Carolyn, 4,885,500, Cl. 313-256.000.

Fleischmann, Dale. Heat transfer unit. 4,885,017, Cl. 62-6.000.

Fleming, David F.; Kerlin, Harold W.; Pauza, William V.; and Sheesley, Wilmer L., to AMP Incorporated. Capacitive coupled connector. 4,884,982, Cl. 439-620.000.

Flexwatt Corporation: *See—*
Grise, Frederick G., 4,884,865, Cl. 350-96.240.

Flint & Walling, Inc.: *See—*
Doyle, Lorin G., 4,885,084, Cl. 210-132.000.

Flint & Walling Industries, Inc.: *See—*
Kachuk, Paul T., 4,885,440, Cl. 200-80.00R.

Flood, Ralph. Pocket tool. 4,884,307, Cl. 7-156.000.

FMC Corporation: *See—*
Theodoridis, George, 4,885,025, Cl. 71-92.000.

Foa, Marco: *See—*
Gardano, Andrea; Casagrande, Francesco; Foa, Marco; Petrini, Guido; Barisone, Riccardo; and Chapoy, Lawrence, 4,885,409, Cl. 568-834.000.

Foehl, Arthur. Safety helmet. 4,884,302, Cl. 2-424.000.

Fogarty, William M. Board game apparatus. 4,884,818, Cl. 273-256.000.

Foglia, Henry R., to International Business Machines Corp. Broadband and baseband lan. 4,885,747, Cl. 370-123.000.

Foley, Gary W.: *See—*
Kemp, Robert A.; Nelson, William I.; and Foley, Gary W., 4,884,925, Cl. 406-109.000.

Folkers, Karl; and Wolaniuk, Janusz, to Board of Regents, The University of Texas System. Restoration of impaired cardiac function of patients with diverse muscular dystrophies by therapy with coenzyme Q10. 4,885,167, Cl. 424-94.100.

Fomico International, Inc.: *See—*
Smith, Peter J., 4,884,921, Cl. 405-286.000.

Fong, Dodd W., to Nalco Chemical Company. Alkoxylated/cationically modified amide-containing polymers. 4,885,345, Cl. 525-329.400.

Fonneland, Nils J.: *See—*
Brandstetter, Robert W.; Fonneland, Nils J.; and Grieve, Philip G., 4,884,867, Cl. 350-162.120.

Fontaine, Paul; Frommann, Klaus; and Michel, Rolf, to Fontaine, Paul. Single or two-sided galvanizing plant. 4,884,525, Cl. 118-65.000.

Fontanes, Sylvain; Birot, Patrice; Marguinaud, Andre ; Quignon, Thierry; and Romann, Brigitte, to Societe Anonyme dite: Alcatel Espace. Method of demodulating digitally modulated signals, and apparatus implementing such a method. 4,885,756, Cl. 375-82.000.

Ford, Ellen L.: *See—*
Ford, Kenneth R.; Ford, Ellen L.; Nygren, Edward; and Nygren, Joyce, 4,884,816, Cl. 273-240.000.

Ford, Kenneth R.; Ford, Ellen L.; Nygren, Edward; and Nygren, Joyce. Thesaurus game apparatus. 4,884,816, Cl. 273-240.000.

Ford Motor Company: *See—*
Daggett, Walter E.; and Zaracki, Stanley J., 4,884,471, Cl. 74-758.000.
Moskowitz, David; and Phillips, Charles W., 4,885,030, Cl. 75-238.000.
Padgaonkar, Arvind J., 4,884,744, Cl. 237-12.30R.
Parker, William A.; Bartos, Thomas E.; and Stewart, William M., 4,884,665, Cl. 188-322.170.
Pirault, Jean P.; Rowbotham, Mervyn; and Biggs, David A., 4,884,900, Cl. 384-434.000.

Ford New Holland, Inc.: *See—*
Steinkamp, John O.; Ball, Garry L.; and Radke, Daniel D., 4,884,940, Cl. 414-715.000.

Ford, Thomas E. Bottle carrier. 4,884,683, Cl. 206-163.000.

Foster, Thomas S.: *See—*
Hussain, Anwar A.; Dittert, Lewis W.; and Foster, Thomas S., 4,885,287, Cl. 514-159.000.

Fox, Daniel W.; and Peters, Edward N., to General Electric Company. Method for recovering a dihydric phenol from a scrap polyester. 4,885,407, Cl. 568-724.000.

Franckx, Joris R. I.: *See—*
Amoyal, William E.; and Franckx, Joris R. I., 4,885,432, Cl. 174-92.000.

Franks, George J., Jr. Clamp for electrically conductive strips. 4,884,976, Cl. 439-92.000.

Franz Plasser Bannbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; Hansmann, Johann; and Oellerer, Friedrich, 4,884,509, Cl. 104-9.000.

Freadman, Tommyca; and Castagna, John F., to Sparkomatic Corporation. Tower-type speaker cabinet with pivoted plural speaker subassembly. 4,884,655, Cl. 181-145.000.

Frey, Alan E.: *See—*
Bowers, Thomas E.; Frey, Alan E.; Kerr, Howard A.; Russell, Larry A.; and Stone, Roger E., 4,885,738, Cl. 370-58.100.

Fricke, William C.: *See—*
Telfair, William B.; Martin, Clifford A.; Gordon, Eugene I.; and Fricke, William C., 4,885,471, Cl. 250-461.100.

Fried Krupp, GmbH: *See—*
Mayer, Kurt; Richey, Volker; and Schneider, Hans-Peter, 4,885,530, Cl. 324-61.00R.

Friedrich Deckel Aktiengesellschaft: *See—*
Strauss, Walter, 4,884,481, Cl. 82-1.200.

Fritzberg, Alan R.: *See—*
Wilbur, Daniel S.; Fritzberg, Alan R.; and Jones, David S., 4,885,153, Cl. 424-1.100.

Frommann, Klaus: *See—*
Fontaine, Paul; Frommann, Klaus; and Michel, Rolf, 4,884,525, Cl. 118-65.000.

Fry, John J.; Hall, George, II; and Smith, Robert A., to Gas Research Institute. Diagnostic system for combustion controller. 4,885,573, Cl. 340-519.000.

Fuchs, Dieter: *See—*
Allgauer, Gunter; Strohhacker, Peter; and Fuchs, Dieter, 4,884,700, Cl. 209-685.000.

Fuji Electric Company Ltd.: *See—*
Miyagawa, Michiaki; Oki, Koichi; and Horii, Hiroyuki, 4,885,784, Cl. 382-8.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Fujiki, Haruo; and Tezuka, Kazunari, 4,884,650, Cl. 180-197.000.
Sogawa, Yoshiyuki, 4,884,546, Cl. 123-486.000.
Sogawa, Yoshiyuki, 4,884,548, Cl. 123-492.000.

Fuji Kiko Co., Ltd.: *See—*
Kobayashi, Satoshi; and Kato, Koji, 4,884,668, Cl. 192-4.00A.

Fuji Photo Film Co., Ltd.: *See—*
Araki, Hiroaki; Ejiri, Kiyomi; and Ohya, Takao, 4,885,208, Cl. 428-403.000.
Goto, Shigenori; and Iwai, Fumio, 4,885,599, Cl. 354-173.110.
Hara, Makoto, 4,885,696, Cl. 364-497.000.
Horikawa, Kazuo, 4,885,467, Cl. 250-327.200.
Inagaki, Yoshio; Adachi, Keiichi; and Suzuki, Yoshiaki, 4,885,228, Cl. 430-270.000.
Kawakami, Hiroshi; and Igarashi, Akira, 4,885,271, Cl. 503-214.000.
Nakamura, Taku, 4,885,227, Cl. 430-254.000.
Okino, Yoshiharu, 4,885,608, Cl. 355-107.000.
Shimura, Kazuo, 4,885,468, Cl. 250-327.200.
Sunagawa, Hiroshi; Nishihara, Hiroshi; and Suhara, Toshiaki, 4,885,732, Cl. 369-44.000.
Yamamoto, Soichiro; and Kawata, Ken, 4,885,224, Cl. 430-138.000.
Yasunaga, Tadashi; and Shirahata, Ryuji, 4,885,189, Cl. 427-129.000.

Fujii, Satoru; Niyada, Katsuyuki; Morii, Shuji; and Watanabe, Taisuke, to Matsushita Electric Industrial Co., Ltd. Apparatus for speech recognition. 4,885,791, Cl. 381-43.000.

Fujii, Satoshi, to Sumitomo Electric Industries, Ltd. Wear-resistant sintered iron-based alloy and process for producing the same. 4,885,133, Cl. 419-29.000.

Fujiki, Haruo; and Tezuka, Kazunari, to Fuji Jukogyo Kabushiki Kaisha. Slip detecting system for a four-wheel drive motor vehicle. 4,884,650, Cl. 180-197.000.

Fujikiko Kabushiki Kaisha: *See*—
Yamamoto, Yoshimi, 4,884,778, Cl. 248-548.000.

Fujikura Ltd.: *See*—
Sugimoto, Mamoru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Aoki, Shin'ya; and Nakagawa, Mikio, 4,885,273, Cl. 505-1.000.

Fujimoto, Akihiko, to Mitsubishi Denki Kabushiki Kaisha. Numerical control device with general purpose setting display. 4,885,695, Cl. 364-474.230.

Fujimoto, Naonobu: *See*—
Fukushima, Takeo; Mizuguchi, Masami; Furukawa, Takahiro; Yato, Yoshiaki; Sato, Kenji; Fujimoto, Naonobu; and Murase, Tetsuro, 4,885,746, Cl. 370-102.000.

Fujimoto, Yoshiki: *See*—
Nishimoto, Shigeto; Fujimoto, Yoshiki; Inoue, Noriaki; and Harada, Shunji, 4,884,449, Cl. 73-660.000.

Fujimura, Masaki: *See*—
Nagasaki, Yoichi; Nagamoto, Itsushi; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,884,812, Cl. 273-167.00H.

Fujioka, Tetsuya: *See*—
Koichi, Yasushi; Mizuishi, Haruzi; Funaki, Mutuko; and Fujioka, Tetsuya, 4,885,466, Cl. 250-324.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Matsuo, Masaaki; Morino, Daizo; Tsuji, Kiyoshi; and Okumura, Hiroyuki, 4,885,297, Cl. 514-253.000.

Fujita, Masafumi; Yamade, Yasushi; and Saijo, Takao, to Minolta Camera Kabushiki Kaisha. Negative/positive microfilm discriminating system. 4,885,605, Cl. 355-41.000.

Fujita, Yoshitada; Hanada, Sadashi; and Yamamoto, Yoshiaki, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for handling large-sized articles. 4,884,938, Cl. 414-541.000.

Fujitani, Makoto; Hirabayashi, Masashi; Honda, Hideo; Machida, Hiroshi; Kondo, Masami; and Onoda, Sachio, to Mitsubishi Jukogyo Kabushiki Kaisha; and Churyo Engineering Kabushiki Kaishi. Rotary compressor with clearance volumes to offset pulsations. 4,884,956, Cl. 418-15.000.

Fujito, Bakugo: *See*—
Ban, Keisuke; Sato, Masakazu; Fujito, Bakugo; and Kikuchi, Kousuke, 4,884,621, Cl. 164-4.100.

Fujitsu Limited: *See*—
Fukushima, Takeo; Mizuguchi, Masami; Furukawa, Takahiro; Yato, Yoshiaki; Sato, Kenji; Fujimoto, Naonobu; and Murase, Tetsuro, 4,885,746, Cl. 370-102.000.
Oritani, Atsushi, 4,885,479, Cl. 307-443.000.

Fujiwara, Takeshi: *See*—
Koshigoe, Shinpei; and Fujiwara, Takeshi, 4,885,505, Cl. 315-3.000.

Fujiwara, Tatsuo: *See*—
Imanaka, Asaji; Fujiwara, Tatsuo; and Osaka, Shuichi, 4,885,693, Cl. 364-426.020.

Fukami, Tadashi: *See*—
Sugiki, Hiraku; Ino, Hiroyuki; and Fukami, Tadashi, 4,885,647, Cl. 360-73.120.

Fukatsu, Takeo: *See*—
Takeuchi, Masaru; Gotoh, Kazuyuki; Wakisaka, Kenichiro; Honma, Kazuhiko; Fukatsu, Takeo; Nakano, Shoichi; and Kuwano, Yukinori, 4,885,226, Cl. 430-65.000.

Fukinuki, Takahiko; Hirano, Yasuhiro; Yoshigi, Hiroshi; and Jusa, Hidehiko, to Hitachi, Ltd. High resolution color television signal transmission system and receiver utilizing motion information of a picture. 4,885,631, Cl. 358-21.00R.

Fukuda, Ichio: *See*—
Sumi, Sigeo; Hamamura, Fumio; Fukuda, Ichio; Seki, Mitsuhiro; and Sawada, Noriyasu, 4,885,048, Cl. 156-552.000.

Fukuda, Kousaku: *See*—
Murakami, Hirohiko; Ogawa, Toru; and Fukuda, Kousaku, 4,885,147, Cl. 423-261.000.

Fukuda, Kyohei; Sakurai, Soichi; Hirata, Koji; and Mori, Shigeru, to Hitachi, Ltd. Lens system for projection television receivers. 4,884,879, Cl. 350-432.000.

Fukuhara, Akihiko: *See*—
Kenmochi, Kazuhito; Fukuhara, Akihiko; Komatu, Tomio; Kitahama, Masanori; Abe, Hideo; Kishida, Akira; Yanagishima, Fumiya; and Kobayashi, Makoto, 4,885,042, Cl. 148-12.00E.

Fukushima, Takeo; Mizuguchi, Masami; Furukawa, Takahiro; Yato, Yoshiaki; Sato, Kenji; Fujimoto, Naonobu; and Murase, Tetsuro, to Fujitsu Limited. Frequency converter. 4,885,746, Cl. 370-102.000.

Fukushima, Yoshihisa; Satoh, Isao; Ichinose, Makoto; Kuroki, Yuzuru; and Takagi, Yuuji, to Matsushita Electric Industrial Co., Ltd. Information recording and reproducing apparatus with management of defective sector. 4,885,735, Cl. 369-59.000.

Fukutaka, Takashi: *See*—
Nozaka, Kenkichi; Kawahara, Yosihiro; and Fukutaka, Takashi, 4,884,639, Cl. 172-47.000.

Funaki, Mutuko: *See*—
Koichi, Yasushi; Mizuishi, Haruzi; Funaki, Mutuko; and Fujioka, Tetsuya, 4,885,466, Cl. 250-324.000.

Funk, Hans G.; Neumann, Frank; and Schafer, Dankmar, to Johannes Schaefer vorm. Stettiner Schraubenwerke GmbH & Co. KG. Plug-in connection for connecting tube and host lines in particular for use in tube-line systems of motor vehicles. 4,884,829, Cl. 285-24.000.

Furukawa, Seijiro; Etoh, Hiroyuki; Ishizaka, Akitoshi; and Shimada, Toshikazu, to Hitachi, Ltd. Semiconductor device with crystalline silicon-germanium-carbon alloy. 4,885,614, Cl. 357-16.000.

Furukawa, Takahiro: *See*—
Fukushima, Takeo; Mizuguchi, Masami; Furukawa, Takahiro; Yato, Yoshiaki; Sato, Kenji; Fujimoto, Naonobu; and Murase, Tetsuro, 4,885,746, Cl. 370-102.000.

Furuno Electric Company Limited: *See*—
Minohara, Kiyomi; Sogabe, Satoshi; and Suzuki, Shinichiro, 4,884,522, Cl. 114-125.000.

Furuta, Kazumitsu: *See*—
Yamamura, Masaaki; Inokoshi, Junichi; Ito, Tetuo; Furuta, Kazumitsu; and Shimizu, Kazuo, 4,885,102, Cl. 252-8.800.

Fusion Systems Corporation: *See*—
Ury, Michael G.; Matthews, John C.; and Rounds, Stuart N., 4,885,047, Cl. 156-345.000.

G. Rodenstock Instrumente GmbH: *See*—
Reis, Werner, 4,884,884, Cl. 351-221.000.

Gaeta, Federico C. A.: *See*—
Andrews, David R.; Gaeta, Federico C. A.; and Watkins, Robert W., 4,885,293, Cl. 514-223.200.

GAF Chemicals Corporation: *See*—
Tracy, David J.; and Hashem, Mohamed M., 4,885,371, Cl. 548-554.000.

GAF Corporation: *See*—
De Thomas, Waldo, 4,885,410, Cl. 568-861.000.
De Thomas, Waldo; and Taylor, Paul D., 4,885,411, Cl. 568-864.000.
Dougherty, James A.; and Vara, Fulvio J., 4,885,319, Cl. 522-31.000.
Tracy, David J.; Rizzo, Thomas; and Login, Robert B., 4,885,158, Cl. 424-69.000.

Gagnon, Laurent, to DSH. Corner connector for sliding doors. 4,884,371, Cl. 49-501.000.

Gallagher-Kaiser Corporation: *See*—
Rich, Douglas A.; Rick, Paul N.; Bournias, James N.; and Lyons, Robert E., 4,885,010, Cl. 55-241.000.

Galliani, Giulio: *See*—
Toja, Emilio; Gorini, Carlo; Barzaghi, Fernando; and Galliani, Giulio, 4,885,306, Cl. 514-425.000.
Toja, Emilio; Gorini, Carlo; Barzaghi, Fernando; and Galliani, Giulio, 4,885,307, Cl. 514-425.000.

Gallucci, Robert R.; Wroczynski, Ronald J.; Jones, James F.; and Rasch, Stefan F., to General Electric Company. Low gloss thermoplastic blends. 4,885,335, Cl. 525-67.000.

Gardano, Andrea; Casagrande, Francesco; Foa, Marco; Petrini, Guido; Barisone, Riccardo; and Chapoy, Lawrence, to Montedison S.p.A. Process for the hydrogenation of bis-phenols. 4,885,409, Cl. 568-834.000.

Gardellini, Vedasto. Paper currency acceptor and method of handling paper currency for vending machines and the like. 4,884,671, Cl. 194-207.000.

Garnier Ponsonnet - Vuillard S.A.: *See*—
Muraro, Pierre; and Pernot, Daniel, 4,884,675, Cl. 198-358.000.

Garoche, Didier: *See*—
Grollier, Jean F.; and Garoche, Didier, 4,885,006, Cl. 8-423.000.

Garrison, Terry: *See*—
Sellers, William; and Garrison, Terry, 4,884,412, Cl. 62-115.000.

Garvie, Ronald C.: *See*—
Hughan, Robert R.; Hannink, Richard H. J.; Swain, Michael V.; Stringer, Robert K.; Murray, Michael J.; and Garvie, Ronald C., 4,885,266, Cl. 501-104.000.

Gas Research Institute: *See*—
Fry, John J.; Hall, George, II; and Smith, Robert A., 4,885,573, Cl. 340-519.000.
Kardos, Peter, 4,884,963, Cl. 431-1.000.

Gasper, Elon, to Bright Star Technology, Inc. Speech synchronized animation. 4,884,972, Cl. 434-185.000.

Gasseev, Amiran F.: *See*—
Ksovreli, Robinzon I.; Didebulidze, Alexandr K.; Kochiev, Valery K.; and Gasseev, Amiran F., 4,885,487, Cl. 310-36.000.

Gasser, Hermann; Curiger, Karl; and Rutz, Hans, to Hollingsworth GmbH. Apparatus for gathering a textile fibre fleece and forming a fibre sliver. 4,884,320, Cl. 19-106.00R.

Gaston County Dyeing Machine Co.: *See*—
Zeiffer, Dieter F.; and Junkins, George M., 4,884,893, Cl. 366-176.000.

Gaughan, Glen T.: *See*—
Tweedle, Michael F.; Gaughan, Glen T.; and Hagan, James T., 4,885,363, Cl. 540-465.000.

Gay, Benjamin A.: *See*—
Lowndes, William, III; Gay, Francis V., II; and Gay, Benjamin A., 4,884,958, Cl. 425-62.000.

Gay, Francis V., II: *See*—
Lowndes, William, III; Gay, Francis V., II; and Gay, Benjamin A., 4,884,958, Cl. 425-62.000.

Gaz de France: *See*—
Le Gac, Jean-Yves; Devilleger, Denis; and Majewski, Philippe, 4,884,633, Cl. 166-75.100.

Gazzani, Giovanni, to Crinos Industria Farmacobiologica Spa. Cosmetic composition containing glycoproteins for the skin care. 4,885,169, Cl. 424-104.000.

GB Electrical, Inc.: *See*—
Custin, James R., 4,884,339, Cl. 30-90.400.

Gebald, Gregor: *See*—
Maassen, Wilhelm; Gebald, Gregor; and Thomas, Ulrich, 4,884,699, Cl. 209-587.000.

Geeves, Garry L. Storage container for use in trunks of vehicles. 4,884,733, Cl. 224-311.000.

Geittner, Peter E.: *See*—
Bachmann, Peter K.; Geittner, Peter E.; Lydtin, Hans-Jurgen; and Romanowski, Gerd, 4,885,018, Cl. 65-3.110.

Gempeler, Hans: *See*—
Hofer, Arnold; and Gempeler, Hans, 4,885,354, Cl. 528-94.000.

General Chemical Corporation: *See*—
Kemp, Robert A.; Nelson, William I.; and Foley, Gary W., 4,884,925, Cl. 406-109.000.

General DataComm, Inc.: *See*—
Gordon, David P., 4,885,745, Cl. 370-110.100.

General Dynamics Corporation, Convair Division: *See*—
Bartholomew, Bruce J., 4,885,460, Cl. 250-216.000.
Bartholomew, Bruce J., 4,885,478, Cl. 307-425.000.

General Electric Company: *See*—
Boutni, Omar M.; and Pratt, Charles F., 4,885,336, Cl. 525-67.000.
Crawford, Carl R., 4,885,688, Cl. 364-413.220.
Edward, Brian J.; and Wanuga, Stephen, 4,885,589, Cl. 342-175.000.
Fox, Daniel W.; and Peters, Edward N., 4,885,407, Cl. 568-724.000.
Gallucci, Robert R.; Wroczynski, Ronald J.; Jones, James F.; and Rasch, Stefan F., 4,885,335, Cl. 525-67.000.
Hasan, Moh'd A., 4,885,590, Cl. 342-196.000.
Hayes, Cecil E., 4,885,541, Cl. 324-322.000.
Hillig, William B.; and McGuigan, Henry C., 4,885,265, Cl. 501-95.000.
Peil, William, 4,885,671, Cl. 363-17.000.
Roemer, Peter B.; Bottomley, Paul A.; and Edelstein, William A., 4,885,539, Cl. 324-318.000.
Thrift, Robert L.; and Morris, Paul K., 4,885,549, Cl. 324-307.000.

General Foods Corporation: *See*—
Cochran, Stuart A.; Benjamin, Earl J.; Crocker, Mary E.; Seidel, William C.; and Cipriano, Vicki L., 4,885,180, Cl. 426-241.000.

General Motors Corporation: *See*—
Bensing, Gregory L.; Nadasky, Thomas M.; and Wright, Raymond C., 4,884,980, Cl. 439-606.000.
Embach, James T., 4,885,565, Cl. 340-407.000.
Gokhale, Kalyan P., 4,885,493, Cl. 310-190.000.
Schubert, Peter J.; and Wallace, Robert J., 4,885,618, Cl. 357-23.110.

General Signal Corporation: *See*—
Maher, Joseph A.; Vowles, E. John; Napoli, Joseph D.; Zafiropoulo, Arthur W.; and Miller, Mark W., 4,885,050, Cl. 156-345.000.

Genesee Polymers Corporation: *See*—
Kendall, Steven S., 4,884,641, Cl. 173-94.000.

Genin, Jacques. Active dipole telephone line protection device. 4,885,768, Cl. 379-200.000.

Gentex Corporation: *See*—
Aileo, Jackson A., 4,884,301, Cl. 2-421.000.

George, Pascal; Sevrin, Mireille; and Maloizel, Christian. 2-((4-Piperidyl)methyl)-1,2,3,4-tetrahydroisoquinoline derivatives, their preparation and their application in therapy. 4,885,302, Cl. 514-307.000.

Gerber Garment Technology, Inc.: *See*—
Vaida, Robert M.; Osthus, Harold L.; and Kuchta, Richard, 4,884,510, Cl. 104-91.000.

Gergory, Harbert S. Dental appliance. 4,884,311, Cl. 15-167.100.

Gerich, Frank: *See*—
Schmale, Gerhard; Gerich, Frank; and Barda, Rudolph C., 4,884,845, Cl. 297-367.000.

Gerondale, Michael J.: *See*—
Harrison, Charles W.; Gerondale, Michael J.; Patrone, Anthony J.; and Ong, James O. Y., 4,885,062, Cl. 196-14.500.

Gerot-Pharmazeutika Gesellschaft m.b.H.: *See*—
Jensen, Finn; and Nadherny, Rudolph E., 4,885,061, Cl. 188-206.00R.

Gerwin, Brenda I.: *See*—
Reddel, Roger R.; Yang, Ke; Rhim, Johng S.; Brash, Douglas; Su, Robert T.; Lechner, John F.; Gerwin, Brenda I.; Harris, Curtis C.; and Amstad, Paul, 4,885,238, Cl. 435-29.000.

Giannakopoulos, Cidell M. Disposable kitty litter box and bag combination. 4,884,526, Cl. 119-1.000.

Gibson, Jeremy H., to Leichtung Inc. Dowelling jig. 4,884,926, Cl. 408-115.00R.

Gierke, Martin P.: *See*—
Miner, Jonathan L.; Lacher, Vernon R.; Rescigno, Gerald J.; Swim, William B.; Gierke, Martin P.; and Hahn, David A., 4,884,314, Cl. 15-344.000.

Gil, Yoram. Swimmer's propulsion aid. 4,884,986, Cl. 441-60.000.

Gilgenbach, Ronald M., to University of Michigan-Ann Arbor, The. Electron beam, ion beam, or neutral particle beam induced modification of or enhancement of combustion reactions. 4,885,065, Cl. 204-157.600.

Gillberg-LaForce, Gunilla E.; Leslie, Thomas M.; Che, Tessie M.; and Borzo, Marie, to Hoechst Celanese Corporation. Nonlinear optically responsive inorganic-organic composite compositions. 4,885,113, Cl. 252-582.000.

Gille, Gunther; and Goertler, Horst, to SWF Auto-Electric GmbH. Wiper circuit system for motor vehicles. 4,885,512, Cl. 318-444.000.

Gillespie, John R., to Gillespie & Powers, Inc. Apparatus for generating a vortex in a melt. 4,884,786, Cl. 266-235.000.

Gillespie & Powers, Inc.: *See*—
Gillespie, John R., 4,884,786, Cl. 266-235.000.

Gillig, Steven F.: *See*—
Hietala, Alexander W.; and Gillig, Steven F., 4,885,553, Cl. 331-17.000.

Ginnaga, Akihiro; Nishihara, Tsukasa; Kawahara, Tetsuo; Susumi, Sadao; Mizokami, Hiroshi; and Sakoh, Mitsuo, to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute. Method for the purification of LPF-HA. 4,885,359, Cl. 530-396.000.

Gleason Reel Corp.: *See*—
Tenniswood, David M.; Pea, Kevin I.; and Loeck, Steven M., 4,885,437, Cl. 200-31.00R.

Glenn, Willie L. Educational automotive game method of play. 4,884,815, Cl. 273-240.000.

Goddard, John, to Rolls Royce plc. Oscillating mechanism. 4,884,736, Cl. 228-2.000.

Godfrey, Otis W.: *See*—
Ingolia, Thomas D.; Queener, Stephen W.; Samson, Suellen M.; Skatrud, Paul L.; and Godfrey, Otis W., 4,885,251, Cl. 435-183.000.

Goebel, Dan M.: *See*—
Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.

Goeman, Donald D.: *See*—
Newhouse, Thomas J.; Goeman, Donald D.; and McClung, Duane G., 4,884,513, Cl. 108-50.000.

Goertler, Horst: *See*—
Gille, Gunther; and Goertler, Horst, 4,885,512, Cl. 318-444.000.

Goetz, Kurt A. Clamping holder for fixing a support rod to a child's bed. 4,884,306, Cl. 5-503.000.

Gohbayashi, Masayoshi; Narita, Noritsugu; and Maruno, Makoto, to Yoshitomi Pharmaceutical Industries, Ltd. Method of producing tetrakis[3,5-di-tert-butyl-4-hydroxyphenyl)propionyloxymethyl]methane. 4,885,382, Cl. 560-75.000.

Gokhale, Kalyan P., to General Motors Corporation. Output voltage control apparatus of a permanent magnet alternator. 4,885,493, Cl. 310-190.000.

Golben, Peter M., to Ergenics, Inc. Solar powered pump with electrical generator. 4,884,953, Cl. 417-379.000.

Goldcamp, William J.: *See*—
Wilburn, William M., 4,885,524, Cl. 320-25.000.

Golden, Glenn D., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Data transmission with improved message format. 4,885,749, Cl. 371-32.000.

Gonchoroff, Nick J.: *See*—
Evans, Elizabeth L.; Gonchoroff, Nick J.; Greipp, Philip R.; Houck, David W.; Katzmann, Jerry A.; Kyle, Robert A.; and Loken, Michael R., 4,885,237, Cl. 435-6.000.

Gontowski, Walter S., Jr., to Cherry Semiconductor Corporation. Voltage controllable current source. 4,885,525, Cl. 323-315.000.

Goodman, James R.: *See*—
Johnson, Susan S.; and Goodman, James R., 4,885,207, Cl. 428-403.000.

Gopal, Gita; and Weinrib, Abel, to Bell Communications Research, Inc. Method for call routing in a network. 4,885,780, Cl. 379-221.000.

Gordon, Bruce S.; and Adler, Alan, to Barnes Engineering Co. Metallized tetra((meso)-5-methyl-2-thiophene)porphines, platinum (5-bromo octaethylporphine) and optical filters containing same. 4,885,114, Cl. 252-589.000.

Gordon, David P., to General DataComm, Inc. Algorithm for minimizing excursion in placement of channel selects into multiplexer frame. 4,885,745, Cl. 370-110.100.

Gordon, Eugene I.: *See*—
Telfair, William B.; Martin, Clifford A.; Gordon, Eugene I.; and Fricke, William C., 4,885,471, Cl. 250-461.100.

Gorini, Carlo: *See*—
Toja, Emilio; Gorini, Carlo; Barzaghi, Fernando; and Galliani, Giulio, 4,885,306, Cl. 514-425.000.
Toja, Emilio; Gorini, Carlo; Barzaghi, Fernando; and Galliani, Giulio, 4,885,307, Cl. 514-425.000.

Gorsk, Inc.: *See*—
Gorski, Lawrence J.; and Gorski, Nancy G., 4,884,558, Cl. 128-11.000.

Gorski, Lawrence J.; and Gorski, Nancy G., to Gorsk, Inc. Laryngoscope assembly including disposable protective enclosure. 4,884,558, Cl. 128-11.000.

Gorski, Nancy G.: *See*—
Gorski, Lawrence J.; and Gorski, Nancy G., 4,884,558, Cl. 128-11.000.

Gosselin, Jerome T., to Minnesota Mining and Manufacturing Company. Electrical wrist band connector for a watch band. 4,885,728, Cl. 368-10.000.

Gosselin, Peter G.: *See*—
Kolodesh, Michael S.; Cash, Walter, Jr.; Davis, Jerry E.; Gosselin, Peter G.; Kock, Ronald W.; Pierson, Bruce A.; Reiboldt, H. Norman; Sabatelli, David A.; and Toms, Douglas, 4,885,182, Cl. 426-482.000.

Goto, Shigenori; and Iwai, Fumio, to Fuji Photo Film Co., Ltd. Prewinding control device for a camera. 4,885,599, Cl. 354-173.110.

Gotoh, Kazuyuki: *See*—
Takeuchi, Masaru; Gotoh, Kazuyuki; Wakisaka, Kenichiro; Honma, Kazuhiko; Fukatsu, Takeo; Nakano, Shoichi; and Kuwano, Yukinori, 4,885,226, Cl. 430-65.000.

Goulet, Roger; Cutri, Joseph; and DeYulio, Joseph, to Cambridge Filter Corporation. HEPA air filter for high temperature environments and method of fabrication. 4,885,015, Cl. 55-497.000.

Govoni, SpA: *See*—
Carlo, Gulmini, 4,884,386, Cl. 53-438.000.

GPAC, Inc.: *See*—
Natale, Anthony; and Natale, Thomas, 4,884,374, Cl. 51-391.000.

Graalmann, Onno; Kreibiehl, Guenter; Turznik, Gerhard; and Weber, Heinz, to BASF Aktiengesellschaft. Foam composite and manufacture thereof. 4,885,206, Cl. 428-316.600.

Grabbe, Dimitry G.: *See*—
Bakermans, Johannes C. W.; and Grabbe, Dimitry G., 4,884,484, Cl. 83-145.000.

Grace, W. Kevin: *See*—
Salzman, Gary C.; Gregg, Charles T.; Grace, W. Kevin; and Hiebert, Richard D., 4,884,886, Cl. 356-367.000.

Graco Inc.: *See*—
Peterson, Richard H., 4,884,592, Cl. 137-234.600.

Gradwell, Paul S.: *See*—
Leather, Terence H.; Naylor, Frank R.; and Gradwell, Paul S., 4,885,797, Cl. 455-40.000.

Graebel, Jeffrey P.: *See*—
Hobbs, James B.; and Graebel, Jeffrey P., 4,885,481, Cl. 307-463.000.

Graef, Harry T.; and Newton, Kevin H., to Diebold Incorporated. Secure transport construction for banking depository devices. 4,884,679, Cl. 198-718.000.

Grafe, Andreas: *See*—
Hartung, Sigurd, deceased; Hartung-Merse, Birgit, heir; Beck, Uwe; Kappler, Ulrich; Mitschker, Alfred; and Grafe, Andreas, 4,885,418, Cl. 570-211.000.

Graham, Everett F.: *See*—
Wells, Kelley J.; and Graham, Everett F., 4,884,552, Cl. 126-19.00R.

Graham, Gary A. Exercise apparatus adjustable during use. 4,884,802, Cl. 272-136.000.

Graham, S. Neal; and Terry, Thomas E. Orbital cap selecting and feeding mechanism. 4,884,678, Cl. 198-392.000.

Grammatica, Steven J.: *See*—
Kuhman, Daniel E.; Jansen, Frank; and Grammatica, Steven J., 4,885,220, Cl. 430-31.000.

Grancey, Thomas A.: *See*—
Christensen, Donald R.; Bateman, Robert; and Grancey, Thomas A., 4,885,792, Cl. 381-119.000.

Grant, Elwyn E.: *See*—
Read, Edgar L.; Grant, Elwyn E.; Keto, Gary A.; Lin, Sharlene C.; Morgan, James D.; Nimon, Robert E.; Oldham, Oliver G.; Adams, Allen R., Jr.; and Salmones, Jose A., 4,885,739, Cl. 370-58.100.

Grant, Nicholas J.: *See*—
Megusar, Janez; Harling, Otto K.; and Grant, Nicholas J., 4,885,128, Cl. 376-463.000.

Grant, Robert B.: *See*—
Nichol, Robert E.; Grant, Robert B.; and Faddis, Charles T., 4,885,707, Cl. 364-551.010.

Grass Valley Group, Inc., The: *See*—
Christensen, Donald R.; Bateman, Robert; and Grancey, Thomas A., 4,885,792, Cl. 381-119.000.
LaBarge, Steven B.; and Waggoner, Bruce, 4,885,582, Cl. 341-57.000.

Grattarola, Maurizuo; and Stella, Domenico, to Contraves Italiana S.p.A. Driving device for extending and withdrawing operative members of a space vehicle. 4,884,464, Cl. 74-50.000.

Gratz, Roy F.: *See*—
Alston, William B.; and Gratz, Roy F., 4,885,116, Cl. 562-413.000.

Graves, Peter W.: *See*—
Greenwood, John C.; Graves, Peter W.; and Neat, Rosamund C., 4,884,450, Cl. 73-702.000.

Gray, Alan; and Arch, Alfred J., to Alcan International Limited. Water treatment in aqueous heat transfer apparatus. 4,885,141, Cl. 422-263.000.

Gray, Randall C., to Motorola, Inc. Voltage clamped differential to single ended converter circuit. 4,885,484, Cl. 307-495.000.

Graybill, John K.: *See*—
Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,885,414, Cl. 570-130.000.

Green, James G., to Photron Pty. Ltd. Hollow cathode assembly and lamp. 4,885,504, Cl. 313-618.000.

Green, William J.: *See*—
Hegedus, Charles R.; and Green, William J., 4,885,324, Cl. 524-204.000.

Greenwood, John C.; Graves, Peter W.; and Neat, Rosamund C., to STC PLC. Sensor device. 4,884,450, Cl. 73-702.000.

Greer, John, to Pratt & Whitney Canada, Inc. Method and apparatus for manufacturing compliant brush seals. 4,884,850, Cl. 300-21.000.

Gregg, Charles T.: *See*—
Salzman, Gary C.; Gregg, Charles T.; Grace, W. Kevin; and Hiebert, Richard D., 4,884,886, Cl. 356-367.000.

Greipp, Philip R.: *See*—
Evans, Elizabeth L.; Gonchoroff, Nick J.; Greipp, Philip R.; Houck, David W.; Katzmann, Jerry A.; Kyle, Robert A.; and Loken, Michael R., 4,885,237, Cl. 435-6.000.

Gresch, Heinrich: *See*—
Jorzyk, Sigurd; Scholl, Gerhard; Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,885,011, Cl. 55-242.000.

Gress, H. Stephen: *See*—
Patino, Hugo; Heard, George E.; Knudsen, Finn B.; and Gress, H. Stephen, 4,885,184, Cl. 426-592.000.

Griebler, Wolf-Dieter: *See*—
Kreth, Wolfgang; and Griebler, Wolf-Dieter, 4,885,034, Cl. 106-449.000.

Grieve, Philip G.: *See*—
Brandstetter, Robert W.; Fonneland, Nils J.; and Grieve, Philip G., 4,884,867, Cl. 350-162.120.

Griffiths, Kenneth F. Multistage fractional freezing for superpurifying crystallizable substances. 4,885,016, Cl. 62-532.000.

Grimes, Michael L. Coin-dispensing apparatus. 4,884,992, Cl. 453-29.000.

Grise, Frederick G., to Flexwatt Corporation. Fiber optic lens and lamp assembly and method for installing same under floor covering and the like. 4,884,865, Cl. 350-96.240.

Grodd, Laurence W.: *See*—
Eisenstein, Gabe L.; Grodd, Laurence W.; McClellan, Paul J.; Miller, Robert M.; Patton, Charles M.; and Wickes, William C., 4,885,714, Cl. 364-709.010.

Groeneveld, Floris J., to EL-O-MATIC-USA, Inc. Fluid motor actuator with compression spring fail-safe mechanism. 4,884,495, Cl. 92-130.00C.

Grollier, Jean F.; and Garoche, Didier, to L'Oreal. Process for dyeing keratinous fibres with indole derivatives combined with an iodide. 4,885,006, Cl. 8-423.000.

Grollier, Jean F.: *See*—
Manoury, Philippe; and Grollier, Jean F., 4,885,296, Cl. 514-252.000.

Grove, Brenda D.: *See*—
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Kemp, Preston B., Jr.; and Johnson, Walter A., 4,884,754, Cl. 241-5.000.
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Spencer, James R.; and Mullendore, James A., 4,885,031, Cl. 75-248.000.

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P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatya ^ V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

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Hansen, Jens, 4,885,801, Cl. 455-264.000.

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Tweedle, Michael F.; Gaughan, Glen T.; and Hagan, James T., 4,885,363, Cl. 540-465.000.

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Umeno, Hidenori; Kubo, Takashige; Hagiwara, Nobutaka; Sato, Hiroaki; and Sawamoto, Hideo, 4,885,681, Cl. 364-200.000.

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Press, Jeffery B.; and Hajos, Zoltan, 4,885,300, Cl. 514-258.000.

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Yao, Ching; Hale, James D.; Crooks, Lawrence E.; and Kaufman, Leon, 4,885,542, Cl. 324-313.000.

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Halliburton Logging Services, Inc.: *See*—
Baird, Gary K., 4,884,439, Cl. 73-155.000.
Rankin, Emmitt E., 4,884,632, Cl. 166-65.100.

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Mattila, Timo; and Elf, Juha, 4,885,461, Cl. 250-223.00B.

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Dornhagen, Horst; Hammer, Hartmut; Haas, Bernd; and Meisenburg, Ewald, 4,885,405, Cl. 568-698.000.

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Perdelwitz, Lee E., Jr.; and Hanke, David E., 4,885,200, Cl. 428-136.000.

Hanke, Wolfgang: *See*—
Schmitt, Manfred; and Hanke, Wolfgang, 4,884,996, Cl. 464-68.000.

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Bernardin, Rodney A.; Hanken, Laurel A.; Insley, Thomas I.; and Murray, Alice C., 4,884,684, Cl. 206-204.000.

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Ishihara, Shunichi; Ootoshi, Hirokazu; Hirooka, Masaaki; Hanna, Junichi; and Shimizu, Isamu, 4,885,258, Cl. 437-40.000.

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Hughan, Robert R.; Hannink, Richard H. J.; Swain, Michael V.; Stringer, Robert K.; Murray, Michael J.; and Garvie, Ronald C., 4,885,266, Cl. 501-104.000.

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Cooper, Roy; and Hansen, Charles, 4,884,333, Cl. 29-596.000.

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Theurer, Josef; Hansmann, Johann; and Oellerer, Friedrich, 4,884,509, Cl. 104-9.000.

Hanson, Paul G.: *See*—
O'Brien, Dennis J.; Hanson, Paul G.; Klarquist, Thomas D.; Nepple, Bruce C.; Park, Michael C.; and Rosas, Robin R., 4,885,763, Cl. 379-67.000.

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Haq, Ikram, to Balfour Beatty Limited. Filling cracks in artificial and natural structures. 4,884,922, Cl. 405-303.000.

Hara, Makoto, to Fuji Photo Film Co., Ltd. Signal processing method for determining base sequence of nucleic acid. 4,885,696, Cl. 364-497.000.

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Nishimoto, Shigeto; Fujimoto, Yoshiki; Inoue, Noriaki; and Harada, Shunji, 4,884,449, Cl. 73-660.000.

Harada, Yasuhiro; Nobumoto, Kazutoshi; Nishimura, Eizi; and Onaka, Toru, to Mazda Motor Corporation. Vehicle slip control apparatus. 4,884,651, Cl. 180-197.000.

Harandi, Mohsen N.; and Owen, Hartley. Multistage reactor system for production of fuels. 4,885,421, Cl. 585-403.000.

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Megusar, Janez; Harling, Otto K.; and Grant, Nicholas J., 4,885,128, Cl. 376-463.000.

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Edwards, John W.; Harper, Daniel R.; and McNew, Quinton B., 4,884,852, Cl. 305-35.0EB.

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Chan, Luen C.; and Menozzi, Jay P., 4,884,971, Cl. 434-2.000.

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Reddel, Roger R.; Yang, Ke; Rhim, Johng S.; Brash, Douglas; Su, Robert T.; Lechner, John F.; Gerwin, Brenda I.; Harris, Curtis C.; and Amstad, Paul, 4,885,238, Cl. 435-29.000.

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McKay, Alexander S.; Livesey, Declan B.; and Harris, Philip, 4,884,635, Cl. 166-271.000.

Harrison, Charles W.; Gerondale, Michael J.; Patrone, Anthony J.; and Ong, James O. Y., to Texaco Inc. Lube oil solvent dewaxing control system. 4,885,062, Cl. 196-14.500.

Harry, John O.; and Verhagen, George. Container for corrosive electrolyte. 4,885,072, Cl. 204-279.000.

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Hartig, Klaus: *See—*
Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich. Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.

Hartman, John E.: *See—*
McCoy, Michael J.; Hartman, John E.; and Wesbster, John L., 4,884,335, Cl. 29-839.000.

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Baschang, Gerhard; Hartmann, Albert; Hirt, Hans; Lucas, Bohumir; and Wirz, Peter, 4,885,285, Cl. 514-114.000.

Hartung, Erika, Volker Hartung, Dirk Hartung, heirs: *See—*
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Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katutomo; and Mukai, Norito, 4,885,431, Cl. 174-68.500.

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Hasegawa, Yo; Okano, Kazuyuki; Nakanishi, Akira; and Hatase, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Process for forming thin film of metal sulfides. 4,885,188, Cl. 427-126.100.

Hashem, Mohamed M.: *See—*
Tracy, David J.; and Hashem, Mohamed M., 4,885,371, Cl. 548-554.000.

Hashimoto, Masanori; Yamamoto, Takeshi; Kawachi, Toru; Kuwashima, Junji; and Kitaoka, Hirokazu, to Dainippon Pharmaceutical Co., Ltd.; and Kurita Water Industries Ltd. Method for the removal of nucleic acids and/or endotoxin. 4,885,168, Cl. 424-95.000.

Hashimoto, Nobuo; Ishii, Hideo; Tanahashi, Kenji; Ohno, Kenji; and Ohno, Kiichi, to Yuugenkaisha Ohnobankinkougyousho. Fluid mixing element. 4,884,894, Cl. 366-338.000.

Hashimoto, Yasuichi, to Kabushiki Kaisha Toshiba. Write compensator for magnetic disk apparatus. 4,885,645, Cl. 360-45.000.

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Hashizume, Kenji: *See—*
Shiba, Haruo; Okamura, Masatoshi; and Hashizume, Kenji, 4,885,651, Cl. 360-132.000.

Hass, Friedrich: *See—*
Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.

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Hatakeyama, Yoshiharu; and Ishiguro, Mitsuo, to Yoshida Industry Co., Ltd. Apparatus for loading cosmetic material into a container and solidifying said cosmetic material. 4,884,601, Cl. 141-71.000.

Hatanaka, Kazuhiro, to Isuzu Motors Limited. Turbo compound engine. 4,884,407, Cl. 60-614.000.

Hatase, Hiroshi: *See—*
Hasegawa, Yo; Okano, Kazuyuki; Nakanishi, Akira; and Hatase, Hiroshi, 4,885,188, Cl. 427-126.100.

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Yoshikawa, Kensei; Ohuchi, Yutaka; Sekiuchi, Kazuto; Saito, Shiuji; Hatayama, Katsuo; and Sota, Kaoru, 4,885,367, Cl. 546-216.000.

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Ferk, Don L.; Schmelzer, Eugene; and Haun, Edward C., 4,885,424, Cl. 585-450.000.

Havira, R. Mark; and Seeman, Bronislaw, to Schlumberger Technology Corporation. Acoustic apparatus and method for detecting borehole wall discontinuities such as vertical fractures. 4,885,723, Cl. 367-35.000.

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Stewart, Peter A. E.; and Hawkesworth, Michael R., 4,885,464, Cl. 250-308.000.

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Noto, Hiroshi; Hayashida, Nobuyuki; Kojima, Taketoshi; Ito, Makoto; and Kambayashi, Osamu, 4,885,580, Cl. 341-23.000.

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Hayes Microcomputer Products, Inc.: *See—*
Speckenbach, Stephen J., 4,885,758, Cl. 375-118.000.

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James, Robert C., 4,884,387, Cl. 53-451.000.

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Head, Claude D., III, to Texas Instruments Incorporated. Segmented asynchronous operation of an automated assembly line. 4,884,674, Cl. 198-341.000.

Head, Richard M. Art form and method of producing same. 4,885,193, Cl. 428-14.000.

Heard, George E.: *See—*
Patino, Hugo; Heard, George E.; Knudsen, Finn B.; and Gress, H. Stephen, 4,885,184, Cl. 426-592.000.

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Banka, Eugene F.; and Hebeler, Charles B., 4,885,650, Cl. 360-122.000.

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Rodi, Anton; and Blaser, Peter T., 4,884,774, Cl. 248-56.000.

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Hemker, Heinrich; and Heidjann, Franz, 4,884,993, Cl. 460-14.000.

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Helbers, Jan; Scholl, Frederick W.; and Coden, Michael H., to Codenoll Technology Corporation. Method and apparatus for detecting the collision of data packets. 4,885,743, Cl. 370-85.200.

Helix Technology Corporation: *See—*
Bell, Steven H.; Stira, Mark A.; and Blotzer, James, 4,884,410, Cl. 62-77.000.

Heller, Michael B.; Sachi, Leonard W.; and Walbridge, David R., to Minnesota Mining and Manufacturing Company. Color proof with non-blocking thermal adhesive layer with particulate polymer beads. 4,885,225, Cl. 430-160.000.

Helmling, Robert: *See—*
Lassmann, Eberhard; Helmling, Robert; and Beran, Franz, 4,885,146, Cl. 423-235.000.

Helmling, Walter: *See—*
Springer, Hartmut; Helmling, Walter; and Schwaiger, Gunther, 4,885,385, Cl. 562-430.000.

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Hempelmann, Heinrich J.; and Pruss, Eugene M., to NI Industries, Inc. Wheel trim retention. 4,884,851, Cl. 301-37.0PB.

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Abend, Phillip G., 4,885,379, Cl. 558-34.000.

Henry, George A.: *See—*
Soucie, William G.; Chen, Wen-Sherng; Witte, Vernon C.; Henry, George A.; and Drehkoff, William D., 4,885,179, Cl. 426-104.000.

Henshaw, Jerry D.: *See—*
Read, Randol R.; Warmack, Ralph E.; Farmer, James M.; Henshaw, Jerry D.; and Marshall, Connie T., 4,885,724, Cl. 367-77.000.

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Henze, Christopher P.; and Smith, James A., to Unisys Corporation. Transformer isolated AC to DC power conditioner with resistive input current. 4,885,675, Cl. 363-26.000.

Hercules Incorporated: *See—*
Bither, Peter G.; Ellers, Berne F.; and Engle, Edward J., III, 4,885,204, Cl. 428-284.000.
Brungardt, Clement L.; and Rush, Pamela K., 4,885,330, Cl. 524-447.000.

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Schmidt, Reinhard, 4,884,319, Cl. 19-80.00R.

Heritage Industries, Inc.: *See—*
Shockey, Brent J.; and Tompkins, Rodney R., 4,884,514, Cl. 109-24.100.

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Newhouse, Thomas J.; Goeman, Donald D.; and McClung, Duane G., 4,884,513, Cl. 108-50.000.

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Eisenstein, Gabe L.; Grodd, Laurence W.; McClellan, Paul J.; Miller, Robert M.; Patton, Charles M.; and Wickes, William C., 4,885,714, Cl. 364-709.010.
Hansen, Stuart; Fjeldsted, John; and Broadbent, Carolyn, 4,885,500, Cl. 313-256.000.
Kaplinsky, George; and Allen, Ross R., 4,885,595, Cl. 346-140.00R.
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Tanaka, Hideshi; Yagi, Kazuyuki; Tanimoto, Shigeru; Komatsu, Yasuaki; Yanagawa, Koichi; and Kuboyama, Yoichi, 4,885,528, Cl. 324-57.00R.
Vanderwater, David A., 4,884,887, Cl. 356-31.000.

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Salzman, Gary C.; Gregg, Charles T.; Grace, W. Kevin; and Hiebert, Richard D., 4,884,886, Cl. 356-367.000.

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Yasuoka, Norio; Kobayashi, Takehiro; Hikida, Nobuharu; Hatakeyama, Yasuyuki; Aoto, Yoshiyuki; and Itogawa, Jiro, 4,885,766, Cl. 379-105.000.

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Millauer, Wolfgang; Benz, Gottfried; Pauli, Heinrich; and Hoyss, Franz, 4,885,511, Cl. 318-434.000.

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Slifkin, Malcolm, 4,885,035, Cl. 127-58.000.

Hindle, Peter H.: *See*—
Edgar, Roger F.; and Hindle, Peter H., 4,885,709, Cl. 364-563.000.

Hinnen, Albert: *See*—
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Fujitani, Makoto; Hirabayashi, Masashi; Honda, Hideo; Machida, Hiroshi; Kondo, Masami; and Onoda, Sachio, 4,884,956, Cl. 418-15.000.

Hiraga, Hiroyuki: *See*—
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Hirano, Muneyoshi: *See*—
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Hirano, Yasuhiro: *See*—
Fukinuki, Takahiko; Hirano, Yasuhiro; Yoshigi, Hiroshi; and Jusa, Hidehiko, 4,885,631, Cl. 358-21.00R.

Hirata, Koji: *See*—
Fukuda, Kyohei; Sakurai, Soichi; Hirata, Koji; and Mori, Shigeru, 4,884,879, Cl. 350-432.000.

Hirooka, Masaaki: *See*—
Ishihara, Shunichi; Ootoshi, Hirokazu; Hirooka, Masaaki; Hanna, Junichi; and Shimizu, Isamu, 4,885,258, Cl. 437-40.000.

Hirose Manufacturing Company, Limited: *See*—
Shimizu, Hiromitsu, 4,884,520, Cl. 112-231.000.

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Hiroto, Hiromi: *See*—
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Baschang, Gerhard; Hartmann, Albert; Hirt, Hans; Lucas, Bohumir; and Wirz, Peter, 4,885,285, Cl. 514-114.000.

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Kanamaru, Hisanobu; and Gunji, Kenichi, 4,884,952, Cl. 417-222.000.

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Fukinuki, Takahiko; Hirano, Yasuhiro; Yoshigi, Hiroshi; and Jusa, Hidehiko, 4,885,631, Cl. 358-21.00R.
Fukuda, Kyohei; Sakurai, Soichi; Hirata, Koji; and Mori, Shigeru, 4,884,879, Cl. 350-432.000.
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Ichimura, Shigeru; Nakasuna, Seiko; Kawarai, Takeshi; Nishiyama, Takanori; and Toyoshima, Shuji, 4,885,643, Cl. 358-335.000.
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Miyamoto, Tomohiko; Koyama, Shuntaro; Tomuro, Jinichi; Morihara, Atsushi; Yamashita, Hisao; Takahashi, Sadao; Kida, Eiji; Ueda, Akio; and Takamoto, Shigehito, 4,884,396, Cl. 60-39.120.
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Okai, Makoto; Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; and Chinone, Naoki, 4,885,753, Cl. 372-45.000.
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Tutamune, Hirotaka; Shiragai, Yasuo; Karino, Yoshiaki; and Wakasa, Yasuyuki, 4,884,698, Cl. 209-534.000.
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Ogawa, Toshio; Nishiyama, Hisashi; Katakura, Kageyoshi; and Ishikawa, Shizuo, 4,884,448, Cl. 73-597.000.

Hitchmough, Geoffrey: *See*—
Lapham, David J.; and Hitchmough, Geoffrey, 4,885,106, Cl. 252-100.000.

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Hobbs, James B.; and Graebel, Jeffrey P., to Honeywell Inc. Configurable memory address decoder for integrated memory circuits with auxiliary memory locations. 4,885,481, Cl. 307-463.000.

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Lenz, Rudiger; Walz, Gerd; Honel, Michael; and Ziegler, Peter, 4,885,392, Cl. 564-503.000.

Hoechst Aktiengesellschaft: *See*—
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Oberhausen, Erich; Kuhlmann, Ludwig; Seibert, Gerhard; Steinstrasser, Axel; Schroth, Hans-Joachim; and Bremer, Karl-Heinz, 4,885,151, Cl. 424-1.100.
Springer, Hartmut; Helmling, Walter; and Schwaiger, Gunther, 4,885,385, Cl. 562-430.000.
Stahlhofen, Paul; and Mohr, Dieter, 4,885,230, Cl. 430-309.000.

Svara, Jurgen; and Weferling, Norbert, 4,885,394, Cl. 568-14.000.
Thurow, Horst, 4,885,164, Cl. 424-85.400.
von der Eltz, Hans-Ulrich, 4,884,308, Cl. 8-149.100.
Weferling, Norbert, 4,885,393, Cl. 568-8.000.

Hoechst Celanese Corporation: *See*—
Gillberg-LaForce, Gunilla E.; Leslie, Thomas M.; Che, Tessie M.; and Borzo, Marie, 4,885,113, Cl. 252-582.000.
Spak, Mark A., 4,885,232, Cl. 430-326.000.

Hoelderich, Wolfgang; Schneider, Kurt; and Hupfer, Leopold, to BASF Aktiengsellschaft. Preparation of alpha, beta-unsaturated ketones. 4,885,395, Cl. 568-314.000.

Hoenniger, John C., III; and Hosier, Kenneth E., Jr., to University of California, The Regents of the. Low data rate low noise serial digital communication link for magnetic resonance imaging systems. 4,885,538, Cl. 324-312.000.

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Weber, Jurgen; Springer, Helmut; and Lappe, Peter, 4,885,383, Cl. 560-103.000.

Hoevel, Lee W.: *See*—
Perry, Kenneth J.; Thefaine, Yannick J.; Hailpern, Brent T.; Hoevel, Lee W.; and Shea, Dennis G., 4,885,578, Cl. 340-825.520.

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Hofer, Karl-Heinz: *See*—
Lorenz, Dotsch; Hofer, Karl-Heinz; Retrayt, Jean-Louis; and Kull, Bernd, 4,884,787, Cl. 266-270.000.

Hoffman, Michael R. Soil coring device with a core ejector mechanism. 4,884,638, Cl. 172-22.000.

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Hoffmann, Kurt; Oberle, Hans-Dieter; Kraus, Rainer; Kowarik, Oskar; and Paul, Manfred, to Siemens Aktiengesellschaft. Method and circuit configuration of the parallel input of data into a semiconductor memory. 4,885,748, Cl. 371-21.300.

Hoffmann-La Roche Inc.: *See*—
Broadhurst, Michael J.; Handa, Balraj K.; Johnson, William H.; Lawton, Geoffrey; and Machin, Peter J., 4,885,283, Cl. 514-78.000.
Welton, Ann F., 4,885,309, Cl. 514-456.000.
Wessel, Hans P., 4,885,361, Cl. 536-118.000.

Hoffmann, Ralph M. Center-fill top cover for oilers. 4,884,661, Cl. 184-88.100.

Hofinger, Manfred: *See*—
Bose, Willibald; Hofinger, Manfred; Hille, Martin; Bohm, Roland; and Staiss, Friedrich, 4,885,110, Cl. 252-341.000.
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Hofmeister, Helmut; Laurent, Henry; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of (Z)-17α-halovinyl steroids. 4,885,117, Cl. 260-397.450.

Hogan, John D., to Beth Israel Hospital Association, The. Isolation, sterilization and maximum observation tent. 4,885,000, Cl. 600-21.000.

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Brown, Ronald E.; Hogan, Robert J.; Coombs, Daniel M.; and Kukes, Simon G., 4,885,080, Cl. 208-218.000.

Hogarth, Ian: *See*—
Paffhausen, Hans; Hogarth, Ian; Scott, Andrew; and Mackintosh, Christine, 4,884,908, Cl. 400-241.200.

Hoge, William H., to Alupower, Inc. Air cathodes and materials therefor. 4,885,217, Cl. 429-27.000.

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Holley, Robert E. Seating assistance device. 4,884,841, Cl. 297-331.000.

Hollingsworth GmbH: *See*—
Gasser, Hermann; Curiger, Karl; and Rutz, Hans, 4,884,320, Cl. 19-106.00R.

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Campbell, John G.; and Thompson, Allan, 4,884,394, Cl. 57-264.000.

Holm-Kennedy, James W.; and Okada, David N. Distributed channel-bipolar device. 4,885,623, Cl. 357-34.000.

Holter, Heinz: *See*—
Jorzyk, Sigurd; Scholl, Gerhard; Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,885,011, Cl. 55-242.000.

Holub, Elvin G. Shoe lace grip. 4,884,321, Cl. 24-712.600.

Home Fashions, Inc.: *See*—
Setele, Richard A., 4,884,616, Cl. 160-236.000.

Honda Giken Kogyo K.K.: *See*—
Kurihara, Norimitsu; and Asakura, Masahiko, 4,885,692, Cl. 364-426.040.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ban, Keisuke; Sato, Masakazu; Fujito, Bakugo; and Kikuchi, Kousuke, 4,884,621, Cl. 164-4.100.
Hattori, Torao, 4,884,997, Cl. 474-28.000.
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Honda, Hideo: *See*—
Fujitani, Makoto; Hirabayashi, Masashi; Honda, Hideo; Machida, Hiroshi; Kondo, Masami; and Onoda, Sachio, 4,884,956, Cl. 418-15.000.

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Mimuro, Tetsushi; Abe, Hiroki; Honda, Masahiro; and Mitsui, Takeshi, 4,884,647, Cl. 180-140.000.

Honel, Michael: *See*—
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Honeywell Inc.: *See*—
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Pray, Robert H.; Ramler, Donald W.; and Juliber, Curtis B., 4,885,694, Cl. 364-464.010.
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Honma, Kazuhiko: *See*—
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Hoog, Waldemar: *See*—
Behrens, Dietmar; Hoog, Waldemar; and Zimmermann, Rudolf, 4,884,691, Cl. 206-444.000.

Hoogovens, Groep B.V.: *See*—
den Hartog, Huibert W.; and van Perlstein, Erik B., 4,885,041, Cl. 148-2.000.

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Horan, Gary C.: *See*—
LaPrad, Richard F.; and Horan, Gary C., 4,884,397, Cl. 60-39.240.

Horiba Ltd.: *See*—
Yamagishi, Yutaka; and Takeda, Kenji, 4,885,469, Cl. 250-345.000.

Horie, Kiyoshi, to CSK Corporation. Optical recording medium with track and track number guides. 4,885,736, Cl. 369-275.000.

Horiguchi, Toshio; Akatsuka, Yuichiro; and Tanaka, Hisakatsu, to Olympus Optical Co., Ltd. Card-form recording medium and data recording device therefor. 4,885,458, Cl. 235-454.000.

Horii, Hiroyuki: *See*—
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Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Shading elimination method. 4,885,467, Cl. 250-327.200.

Horn, Alan S., to Nelson Research & Development Co. Method and compositions for treatment of parkinsonism syndrome in mammals. 4,885,308, Cl. 514-438.000.

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Yoder, Douglas J.; Brown, Ronald E.; Stevenson, Paul E.; Hornback, Donald L.; and Leisure, Ronald K., 4,885,621, Cl. 357-26.000.

Horobin, David D. Modular building-block form. 4,884,382, Cl. 52-426.000.

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Shekhawat, Sampat S.; Dhyanchand, John J.; and Horowy, John, 4,885,486, Cl. 307-570.000.

Horton, Robert, Jr.: *See*—
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Hoshino, Shigeru: *See*—
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Hosiden Electronics Co., Ltd.: *See*—
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Hosier, Kenneth E., Jr.: *See*—
Hoenniger, John C., III; and Hosier, Kenneth E., Jr., 4,885,538, Cl. 324-312.000.

Hosoda, Naoyuki; Tanaka, Masayuki; and Mori, Tamotsu, to Mitsubishi Kinzoku Kabushiki Kaisha. Fine gold alloy wire for bonding of a semi-conductor device. 4,885,135, Cl. 420-507.000.

Hotta, Takayuki: *See*—
Suzuki, Ikuo; Yoneda, Takao; Hotta, Takayuki; and Yonezu, Toshihiro, 4,884,373, Cl. 51-165.710.

Houck, David W.: *See*—
Evans, Elizabeth L.; Gonchoroff, Nick J.; Greipp, Philip R.; Houck, David W.; Katzmann, Jerry A.; Kyle, Robert A.; and Loken, Michael R., 4,885,237, Cl. 435-6.000.

House Food Industrial Company Limited: *See*—
Sengoku, Koji; and Tomita, Misao, 4,884,498, Cl. 99-352.000.

Houser, David E.; and Morenus, Richard J., to International Business Machines, Corp. Resonant stylus support. 4,884,334, Cl. 29-739.000.

Hoyss, Franz: *See*—
Millauer, Wolfgang; Benz, Gottfried; Pauli, Heinrich; and Hoyss, Franz, 4,885,511, Cl. 318-434.000.

Hsu, Henry C. Sound absorbent slats for window blinds. 4,884,615, Cl. 160-236.000.

Huang, Vincent M. S., to A. O. Smith Corporation. Swirl combuster burner. 4,884,555, Cl. 126-350.00R.

Hubbell Incorporated: *See*—
Schnittker, William E., 4,885,429, Cl. 174-65.0SS.

Huber, Floyd M.; Pieper, Richard L.; and Tietz, Anthony J., to Eli Lilly and Company. Process for producing A-21978C derivatives. 4,885,243, Cl. 435-71.300.

Hubner, Romeo J., to Du Pont de Nemours, E. I., and Company. Method of identifying spectra. 4,885,697, Cl. 364-497.000.

Huels Aktiengesellschaft: *See*—
Bueschken, Wilfried, 4,885,397, Cl. 568-341.000.

Huenig, Siegfried; Aumueller, Alexander; and Erk, Peter, to BASF Aktiengesellschaft. Radical ion salts. 4,885,368, Cl. 544-347.000.

Hughan, Robert R.; Hannink, Richard H. J.; Swain, Michael V.; Stringer, Robert K.; Murray, Michael J.; and Garvie, Ronald C., to Commonwealth Scientific and Industrial Research Organization. Zirconia ceramic materials and method for making same. 4,885,266, Cl. 501-104.000.

Hughes Aircraft Company: *See*—
Chien, Kuei-Ru; Hui, Kin-Kwok; Stovall, H. Dean; Wang, John H. S.; and Lamm, Albert J., 4,885,752, Cl. 372-33.000.

Hui, Kin-Kwok: *See*—
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Hulla, Heinz: *See*—
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Hunold, Klaus: *See*—
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Hunter Douglas International N.V.: *See*—
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Hupfer, Leopold: *See*—
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Hurd Lock and Manufacturing Co., Inc.: *See*—
Fancher, Ricky L., 4,884,423, Cl. 70-248.000.

Hurlemann, Ernst, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for cooling the barrel inner wall of a weapon barrel of a firing weapon. 4,884,490, Cl. 89-14.100.

Hurst, Joseph S. Tooth brush case. 4,884,688, Cl. 206-362.200.

Hurst, Richard F. Picker-stripper-feeder for envelope feeding apparatus. 4,884,793, Cl. 271-2.000.

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Hutta, Joseph J., to United States of America, Air Force. Process for making bulk heavy metal fluoride glasses. 4,885,019, Cl. 65-3.110.

Hwang, Dah-min D.; and Nazar, Lawrence R., to Bell Communications Research, Inc. Optically controlled dimpler for preparation of ultra-thin samples. 4,885,051, Cl. 156-345.000.

Hwang, Min-Su. Electronic air-cleaning air conditioner automatically washed by water. 4,884,416, Cl. 62-303.000.

Hydro Data, Inc.: *See*—
Gust, Giselher R., 4,884,892, Cl. 366-136.000.

Hydromatik GmbH: *See*—
Walzer, Winfried; and Reistle, Wolfgang, 4,884,475, Cl. 74-862.000.

Ichimura, Shigeru; Nakasuna, Seiko; Kawarai, Takeshi; Nishiyama, Takanori; and Toyoshima, Shuji, to Hitachi, Ltd. VTR-integrated camera having playback function with movable lens cover for enabling recording mode and playback mode and method therefor. 4,885,643, Cl. 358-335.000.

Ichinose, Makoto: *See*—
Fukushima, Yoshihisa; Satoh, Isao; Ichinose, Makoto; Kuroki, Yuzuru; and Takagi, Yuuji, 4,885,735, Cl. 369-59.000.

ICT International CMOS Technology, Inc.: *See*—
Brahmbhatt, Dhaval J., 4,885,719, Cl. 365-181.000.

Ide, Naoaki: *See*—
Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoaki; and Machida, Hironobu, 4,885,596, Cl. 346-157.000.

IDN Inventions and Development of Novelties AG: *See*—
Ackeret, Peter, 4,884,685, Cl. 206-309.000.

Igarashi, Akira: *See*—
Kawakami, Hiroshi; and Igarashi, Akira, 4,885,271, Cl. 503-214.000.

Igarashi, Taizo: *See*—
Ishizaki, Takaharu; Igarashi, Taizo; Urano, Yasuo; and Onodera, Yumiko, 4,885,008, Cl. 44-62.000.

Igelbuscher, Heinrich: *See*—
Jorzyk, Sigurd; Scholl, Gerhard; Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,885,011, Cl. 55-242.000.

Ihara Chemical Industry Co., Ltd.: *See*—
Yamaguchi, Mikio; Watase, Yukihiro; Kambe, Takeshi; and Katou, Susumu, 4,885,023, Cl. 71-90.000.

Iida, Giichi; and Kodama, Taketomo, to Kioritz Corporation. Starting system for internal combustion engine. 4,884,535, Cl. 123-179.00P.

Iizuka, Takao; and Ota, Akiho, to Yoshino Kogyosho Co., Ltd. Apparatus for forming plastic containers. 4,884,961, Cl. 425-195.000.

Ikai, Takashi: *See*—
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 4,885,022, Cl. 71-86.000.

Ikeda, Masaki: *See*—
Nishino, Atsushi; Mizuno, Yasuo; and Ikeda, Masaki, 4,885,020, Cl. 65-2.000.

Ikeda, Takashi; and Tsunoda, Euji, to Kabushiki Kaisha Toshiba. Junction bolt with adjustable clamping force. 4,884,934, Cl. 411-383.000.

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Sugimoto, Mamoru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Aoki, Shin'ya; and Nakagawa, Mikio, 4,885,273, Cl. 505-1.000.

Ikeuchi, Hiroshi, to Murata Manufacturing Company. High voltage generating apparatus for supplying high voltage to cathode ray tube. 4,885,509, Cl. 315-411.000.

Ikeuchi, Hisaaki; Madokoro, Manabu; Sato, Haruo; and Jodoi, Takashi, to Hitachi, Ltd. Apparatus for handling constituent elements of reactor core. 4,885,123, Cl. 376-233.000.

Imada, Yoshiyuki: *See*—
Satake, Takeshi; and Imada, Yoshiyuki, 4,884,434, Cl. 73-7.000.

Imagitek: *See*—
Vermaat, David, 4,884,798, Cl. 271-307.000.

Imai, Akio: *See*—
Takao, Hiroyoshi; Imai, Akio; and Seki, Tomoaki, 4,885,338, Cl. 525-77.000.

Imakita, Takeshi: *See*—
Kawai, Yoichi; Udagawa, Takatoshi; Imakita, Takeshi; and Yokote, Sachio, 4,885,162, Cl. 424-83.000.

Imanaka, Asaji; Fujiwara, Tatsuo; and Osaka, Shuichi, to Nippon Air Brake Co., Ltd. Wheel-slip detection system. 4,885,693, Cl. 364-426.020.

Imperial Chemical Industries PLC: *See*—
Brown, James P.; Duber, Ernst O.; and Loenders, Mark, 4,885,348, Cl. 525-458.000.

In the United States of America as Represented by the Secretary of the Navy: *See*—
Hoover, Mervyn C.; and Schmitt, Michael L., 4,885,586, Cl. 342-13.000.

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Tsuchiya, Kikuo; Araki, Shingo; Inagaki, Masaji; Kudoh, Yumi; and Kitao, Teijiro, 4,885,270, Cl. 503-209.000.

Inagaki, Yoshio; Adachi, Keiichi; and Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Optical information recording medium. 4,885,228, Cl. 430-270.000.

Inamasu, Nami: *See*—
Sugawara, Mitsutoshi; and Inamasu, Nami, 4,885,581, Cl. 341-145.000.

Inbasekaran, Muthiah N.; and Dirlikov, Stoil K., to Dow Chemical Company, The. Process for making propargyl ethers of bisphenols. 4,885,403, Cl. 568-631.000.

Ince, Francis: *See*—
Dixon, John; and Ince, Francis, 4,885,313, Cl. 514-620.000.

Industrial Technology Research Institute: *See*—
Lee, Lain-tze; Chen, Mei H.; and Yao, Chung-Niang, 4,885,389, Cl. 564-418.000.

Industrikontakt Ing. O. Ellingsen & Co.: *See*—
Ellingsen, Olav, 4,884,634, Cl. 166-248.000.

Infrared Engineering Limited: *See*—
Edgar, Roger F.; and Hindle, Peter H., 4,885,709, Cl. 364-563.000.

Ingolia, Thomas D.; Queener, Stephen W.; Samson, Suellen M.; Skatrud, Paul L.; and Godfrey, Otis W., to Eli Lilly and Company. Recombinant DNA expression vectors and DNA compounds which encode isopenicillin N synthetase. 4,885,251, Cl. 435-183.000.

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Parson, Brian J.; Shepherd, Roger M.; May, Michael D.; and Stewart, Graham, 4,885,740, Cl. 370-60.000.

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Sugiki, Hiraku; Ino, Hiroyuki; and Fukami, Tadashi, 4,885,647, Cl. 360-73.120.

Inokoshi, Junichi: *See*—
Yamamura, Masaaki; Inokoshi, Junichi; Ito, Tetuo; Furuta, Kazumitsu; and Shimizu, Kazuo, 4,885,102, Cl. 252-8.800.

Inomata, Yoshihisa: *See*—
Shimizu, Isoo; Matsumura, Yasuo; and Inomata, Yoshihisa, 4,885,419, Cl. 585-25.000.

Inoue, Noriaki: *See*—
Nishimoto, Shigeto; Fujimoto, Yoshiki; Inoue, Noriaki; and Harada, Shunji, 4,884,449, Cl. 73-660.000.

Insley, Thomas I.: *See*—
Bernardin, Rodney A.; Hanken, Laurel A.; Insley, Thomas I.; and Murray, Alice C., 4,884,684, Cl. 206-204.000.

Institut Gidrokinamiki Im, Lavrentieva: *See*—
Fadeev, Petr Y.; Fadeev, Vladimir Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; and Ermilov, Nikolai P., 4,884,642, Cl. 173-139.000.

Institute Po Technicheska Kibernetika I Robotika: *See*—
Beyazov, Yordan Y.; Nenov, Sasho G.; and Peychev, Vlayko S., 4,884,459, Cl. 73-861.520.

Intech, Inc.: *See*—
Baker, John W., 4,884,571, Cl. 128-310.000.

Intel Corporation: *See*—
Ting, Chiu H.; Rucker, Thomas G.; and Sobczak, Zbigniew P., 4,885,262, Cl. 437-231.000.

Interactive Technologies, Inc.: *See*—
Hackett, Kenneth R., 4,885,568, Cl. 340-518.000.

Intermedics, Inc.: *See*—
Sanders, Richard S., 4,884,575, Cl. 128-419.0PG.

International Business Machines Corporation: *See*—
Al-Jaroudi, Mohammed Y., 4,885,043, Cl. 148-113.000.
Anderson, Herbert R., Jr.; Divakaruni, Renuka S.; Dynys, Joseph M.; Kandetzke, Steven M.; Kirby, Daniel P.; Master, Raj N.; and Casey, Jon A., 4,885,038, Cl. 156-89.000.
Anderson, Karen L.; Pennebaker, William B.; and Pennington, Keith S., 4,885,786, Cl. 382-47.000.

Anthony, John H.; Brantley, William C., Jr.; McAuliffe, Kevin P.; Norton, Vern A.; and Pfister, Gregory F., 4,885,680, Cl. 364-200.000.
Austin, Edward B.; and Robertson, Jeffrey E., 4,885,684, Cl. 364-300.000.
Burger, Wilhelm F.; Carson, Mark E.; Johri, Abhai; and Stokes, Ellen J., 4,885,789, Cl. 380-25.000.
Edwards, Nathen P., 4,885,627, Cl. 357-59.000.
Foglia, Henry R., 4,885,747, Cl. 370-123.000.
Houser, David E.; and Morenus, Richard J., 4,884,334, Cl. 29-739.000.
Miller, Christopher P.; and Patton, Charles S., 4,885,720, Cl. 365-200.000.
Pennebaker, William B.; Mitchell, Joan L.; and Mintzer, Frederick C., 4,885,576, Cl. 340-793.000.
Perry, Kenneth J.; Thefaine, Yannick J.; Hailpern, Brent T.; Hovel, Lee W.; and Shea, Dennis G., 4,885,578, Cl. 340-825.520.
Prakash, Ravinder; and Wolfe, Larry L., 4,884,857, Cl. 350-6.800.
Smith, Normand C., 4,884,905, Cl. 400-124.000.
Susko, Robin A.; and Wilson, James W., 4,885,074, Cl. 204-298.000.

Interprovincial Pipe Line Company: *See—*
Savard, Donald D., 4,885,044, Cl. 148-127.000.

Iomoda, Takashi: *See—*
Miyamoto, Noritaka; Koujiya, Miyuki; Miyake, Joji; Iomoda, Takashi; Ohsawa, Hidetoshi; and Nagami, Tetsuo, 4,885,213, Cl. 428-612.000.

Iowa State University Research Foundation, Inc.: *See—*
Ankeny, Mark D.; Kaspar, Thomas C.; and Horton, Robert, Jr., 4,884,436, Cl. 73-38.000.
Verkade, John G., 4,885,376, Cl. 556-18.000.

IPL Inc.: *See—*
Lesquir, Dominique, 4,884,365, Cl. 47-52.000.

Iqbal, Tahir; Cain, John H., Jr.; and Slosky, Jack J., to Du Pont de Nemours, E. I., and Company. Tris(isonitrile)copper(I) adducts for preparing radionuclide complexes. 4,885,100, Cl. 252-1.000.

Ishida, Masaaki; Miwa, Kiyoshi; Nakamori, Shigeru; and Sano, Konosuke, to Ajinomoto Co., Inc. Process for producing L-tryptophan. 4,885,245, Cl. 435-108.000.

Ishiguro, Mitsuo: *See—*
Hatakeyama, Yoshiharu; and Ishiguro, Mitsuo, 4,884,601, Cl. 141-71.000.

Ishihara, Shunichi; Ootoshi, Hirokazu; Hirooka, Masaaki; Hanna, Junichi; and Shimizu, Isamu, to Canon Kabushiki Kaisha. Method for making a thin film transistor using a concentric inlet feeding system. 4,885,258, Cl. 437-40.000.

Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, to Pioneer Electronic Corporation. Spindle servo device for data recording disk reproducing apparatus. 4,885,644, Cl. 358-342.000.

Ishii, Hideo: *See—*
Hashimoto, Nobuo; Ishii, Hideo; Tanahashi, Kenji; Ohno, Kenji; and Ohno, Kiichi, 4,884,894, Cl. 366-338.000.

Ishii, Mitsuaki; Miyazaki, Masaaki; and Matsunaga, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. Microcomputer applied control unit for use in a vehicle. 4,885,691, Cl. 364-424.040.

Ishikawa, Haruo: *See—*
Nakakura, Hirofumi; Shibata, Morio; Ishikawa, Haruo; Nakano, Akihisa; Hiroto, Hiromi; and Oyabu, Hajime, 4,885,176, Cl. 426-19.000.

Ishikawa, Shizuo: *See—*
Ogawa, Toshio; Nishiyama, Hisashi; Katakura, Kageyoshi; and Ishikawa, Shizuo, 4,884,448, Cl. 73-597.000.

Ishimaru, Kenji: *See—*
Yamamoto, Michio; Kiriyama, Tsutomu; Sasaki, Noriaki; Sakamoto, Yoshitaka; and Ishimaru, Kenji, 4,885,057, Cl. 162-9.000.

Ishizaka, Akitoshi: *See—*
Furukawa, Seijiro; Etoh, Hiroyuki; Ishizaka, Akitoshi; and Shimada, Toshikazu, 4,885,614, Cl. 357-16.000.

Ishizaki, Takaharu; Igarashi, Taizo; Urano, Yasuo; and Onodera, Yumiko, to Nippon Oil and Fats Company, Limited. Method for improving cold flow of hydrocarbon fuel oils. 4,885,008, Cl. 44-62.000.

Israel Aircraft Industries Ltd.: *See—*
Schnarch, Benjamin, 4,884,882, Cl. 350-634.000.

Israel, Gary; Steenod, Wayne; and O'Mara, Richard C., to Avon Products, Inc. Cosmetic display. 4,884,680, Cl. 206-44.110.

Isuzu Motors Limited: *See—*
Hatanaka, Kazuhiro, 4,884,407, Cl. 60-614.000.
Kawamura, Hideo, 4,884,406, Cl. 60-605.300.
Koga, Hidetaka, 4,884,667, Cl. 192-3.550.

Ital Idee s.r.l. an Italian Limited Liability Company: *See—*
Cantoni, Angelo, 4,885,082, Cl. 210-90.000.

Itek Graphix Corp.: *See—*
Robbins, Daniel H., 4,885,606, Cl. 355-73.000.

Ito, Haruyuki; and Matsumoto, Akio, to Toto Ltd. Mold used in pressure casting ceramic articles. 4,884,959, Cl. 425-84.000.

Ito, Makoto: *See—*
Noto, Hiroshi; Hayashida, Nobuyuki; Kojima, Taketoshi; Ito, Makoto; and Kambayashi, Osamu, 4,885,580, Cl. 341-23.000.

Ito, Masazumi: *See—*
Maruta, Syuzi; and Ito, Masazumi, 4,885,609, Cl. 355-202.000.

Ito, Tetuo: *See—*
Yamamura, Masaaki; Inokoshi, Junichi; Ito, Tetuo; Furuta, Kazumitsu; and Shimizu, Kazuo, 4,885,102, Cl. 252-8.800.

Ito, Yukishige: *See—*
Kannagi, Reiji; Shigeta, Katsuyoshi; Ito, Yukishige; Kirihata, Yoshiko; and Ogawa, Tomoya, 4,885,358, Cl. 530-387.000.

Itogawa, Jiro: *See—*
Yasuoka, Norio; Kobayashi, Takehiro; Hikida, Nobuharu; Hatakeyama, Yasuyuki; Aoto, Yoshiyuki; and Itogawa, Jiro, 4,885,766, Cl. 379-105.000.

ITT Corporation: *See—*
Weber, James L., 4,884,403, Cl. 60-547.100.

Iura, Kazuo: *See—*
Yoshida, Kinzi; Yamamoto, Akira; and Iura, Kazuo, 4,884,430, Cl. 72-281.000.

Ivanchenko, Andrei F.: *See—*
Budyko, Viktor A.; Ivanchenko, Andrei F.; Krokhmal, Vladimir M.; Konovalenko, Vladimir V.; Nechvolodov, Georgy V.; Lastochkin, Boris N.; and Kutsov, Valentin D., 4,885,654, Cl. 361-13.000.

Ivashina, Albina I.: *See—*
Fedorov, Svyatoslav N.; Soloviev, Sergei A.; Degtev, Evgeny I.; Ivashina, Albina I.; and Karavaev, Alexandr A., 4,884,569, Cl. 128-305.000.

Iveco Fiat S.p.A.: *See—*
Mathis, Christian, 4,884,545, Cl. 123-447.000.

Iverslie, Scott P.: *See—*
Meline, Harry R.; and Iverslie, Scott P., 4,884,456, Cl. 73-826.000.

Iwabuchi, Toshiyuki: *See—*
Uchiyama, Akira; Masaki, Yuuichi; Iwabuchi, Toshiyuki; Nomoto, Tsutomu; and Sakamoto, Masaaki, 4,885,622, Cl. 357-30.000.

Iwai, Fumio: *See—*
Goto, Shigenori; and Iwai, Fumio, 4,885,599, Cl. 354-173.110.

Iwasa, Kazuyuki; and Nakazawa, Hirotsugu, to Olympus Optical Co., Ltd. Zoom mechanism for a zoom lens in cameras and the like. 4,885,600, Cl. 354-400.000.

Iwasaki, Yoshihiko; and Noguchi, Toyosaburo. Apparatus for maintaining or restoring freshness of vegetable body. 4,884,500, Cl. 99-517.000.

Iwata Electric Co., Ltd.: *See—*
Iwata, Keisuke; and Kojima, Yoshikazu, 4,885,572, Cl. 340-425.500.

Iwata, Keisuke; and Kojima, Yoshikazu, to Iwata Electric Co., Ltd.; and Kobishi Electric Co., Ltd. Anti-theft alarm device for vehicle. 4,885,572, Cl. 340-425.500.

Izaki, Takeshi; and Kawahara, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Pressure developing apparatus. 4,884,501, Cl. 100-176.000.

Izawa, Koji: *See—*
Takagi, Shiro; Sato, Minoru; and Izawa, Koji, 4,885,704, Cl. 364-521.000.

Izon Industries Inc.: *See—*
Sheffield, James, 4,884,962, Cl. 425-234.000.

Izumo, Takeshi: *See—*
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,885,644, Cl. 358-342.000.

J.A.C. Corporation: *See—*
Kelly, George H., 4,885,099, Cl. 210-771.000.

J. C. Moore Research, Inc.: *See—*
Moore, Jesse C., 4,884,534, Cl. 123-52.0MV.

J. M. Huber Corporation: *See—*
Becker, Joachim H., 4,884,773, Cl. 248-639.000.

J. M. Voith GmbH: *See—*
Schmitt, Manfred; and Hanke, Wolfgang, 4,884,996, Cl. 464-68.000.

Jackson, John E.; and Balmer, Norman L., to Union Carbide Corporation. Wear resistant, abrasive laser-engraved ceramic or metallic carbide surfaces for rotary labyrinth seal members. 4,884,820, Cl. 277-53.000.

Jamco Corporation: *See—*
Shibata, Yoji, 4,884,767, Cl. 244-118.500.

James Mackie & Sons Limited: *See—*
Hill, Grenville M., 4,884,764, Cl. 242-158.00R.

James, Robert C., to Hayssen Manufacturing Company. Vertical form-fill-seal method and apparatus. 4,884,387, Cl. 53-451.000.

Janez Megusar: *See—*
Megusar, Janez; Harling, Otto K.; and Grant, Nicholas J., 4,885,128, Cl. 376-463.000.

Jansen, Frank: *See—*
Kuhman, Daniel E.; Jansen, Frank; and Grammatica, Steven J., 4,885,220, Cl. 430-31.000.

Japan Atomic Energy Research Institute: *See—*
Murakami, Hirohiko; Ogawa, Toru; and Fukuda, Kousaku, 4,885,147, Cl. 423-261.000.

Jaquith, Hope; Jaquith, Kent; and Jaquith, William. Coupling device. 4,884,322, Cl. 24-241.0PS.

Jaquith, Kent: *See—*
Jaquith, Hope; Jaquith, Kent; and Jaquith, William, 4,884,322, Cl. 24-241.0PS.

Jaquith, William: *See—*
Jaquith, Hope; Jaquith, Kent; and Jaquith, William, 4,884,322, Cl. 24-241.0PS.

Jarreau, Francois-Xavier; and Koenig, Jean-Jacques, to Norwich Eaton Pharmaceuticals, Inc. Novel 14-amino steroids. 4,885,280, Cl. 514-26.000.

Jensen, Finn; and Nadherny, Rudolph E., to Gerot-Pharmazeutika Gesellschaft m.b.H. Brake hanger suspension. 4,885,061, Cl. 188-206.00R.

JEOL, Ltd.: *See—*
Nagatsuka, Yoshitaka; Saito, Masaki; and Kawabe, Yoshitaka, 4,885,465, Cl. 250-310.000.

Jhaveri, Satish S.; Dunnavant, William R.; and Langer, Heimo J., to Ashland Oil, Inc. Hot box process for preparing foundry shapes with certain aqueous phenolic resin solutions. 4,884,620, Cl. 164-15.000.

Jiang, Lihua: *See*—
Tan, Cheng; and Jiang, Lihua, 4,884,532, Cl. 123-18.00R.

Jinich, Leon; and Varian, Karl R., to Rockwell International Corporation. Power consumption control apparatus. 4,885,798, Cl. 455-52.000.

Jodoi, Takashi: *See*—
Ikeuchi, Hisaaki; Madokoro, Manabu; Sato, Haruo; and Jodoi, Takashi, 4,885,123, Cl. 376-233.000.

Joffe, Edward J. Interconnecting panels for knockdown structures. 4,884,854, Cl. 312-257.100.

Johannes Schaefer vorm. Stettiner Schraubenwerke GmbH & Co. KG: *See*—
Funk, Hans G.; Neumann, Frank; and Schafer, Dankmar, 4,884,829, Cl. 285-24.000.

Johannesson, Niels O., to Coloplast A/S. Method of manufacture of an external catheter for male urinary incontinence. 4,885,049, Cl. 156-289.000.

Johansson, Lennart: *See*—
Ljungkvist, Stig-Åke; and Johansson, Lennart, 4,884,384, Cl. 52-741.000.

John Crane, Inc.: *See*—
Boutin, Allan J.; and Ocheda, Daniel D., 4,884,945, Cl. 415-174.200.

Johnson, Dannis R.: *See*—
Vercellotti, Leonard C.; Anderson, Arthur A.; Christiansen, David A.; Johnson, Dannis R.; Brickner, Laurence R.; Colclaser III, Robert G.; and Leddy, John G., 4,885,564, Cl. 340-310.00A.

Johnson, Harold R., III, to Emerson Electric Co. System for mounting a power transmission member to a shaft. 4,884,916, Cl. 403-370.000.

Johnson, Ralph E.: *See*—
Maglica, Anthony; and Johnson, Ralph E., 4,885,668, Cl. 362-345.000.

Johnson, Richard A.; Anderson, Arthur A.; and Boomgaard, Dirk J., to Thermo King Corporation. Power line carrier communication system. 4,885,563, Cl. 340-310.00A.

Johnson, Roy L., to Lifting Technologies, Inc. Manbasket testing apparatus and method. 4,884,454, Cl. 73-788.000.

Johnson, Susan S.; and Goodman, James R., to UOP. Biocompatible protein or ligand immobilization system. 4,885,207, Cl. 428-403.000.

Johnson, Terrence A. Three-dimensional game and gameboard. 4,884,817, Cl. 273-241.000.

Johnson, Walter A.: *See*—
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,884,754, Cl. 241-5.000.
Kopatz, Nelson E.; Johnson, Walter A.; Vanderpool, Jack E.; and Shaw, Howard H., 4,885,028, Cl. 75-0.5BB.

Johnson, William B.: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; White, Danny R.; and Johnson, William B., 4,885,130, Cl. 419-12.000.

Johnson, William H.: *See*—
Broadhurst, Michael J.; Handa, Balraj K.; Johnson, William H.; Lawton, Geoffrey; and Machin, Peter J., 4,885,283, Cl. 514-78.000.

Johnstonbaugh, Joseph: *See*—
Sadoff, Armin M.; Nelson, Richard C.; Smith, Gerald A.; Johnstonbaugh, Joseph; and Sadoff, Stevn J., 4,884,445, Cl. 73-379.000.

Johnstone, Robert M.; and Wegrzyn, Joseph S., to Dual Lite, Inc. Connector assembly for plug-in energization and battery activation of an associated electrical apparatus. 4,885,474, Cl. 307-66.000.

Johri, Abhai: *See*—
Burger, Wilhelm F.; Carson, Mark E.; Johri, Abhai; and Stokes, Ellen J., 4,885,789, Cl. 380-25.000.

Jones, David S.: *See*—
Wilbur, Daniel S.; Fritzberg, Alan R.; and Jones, David S., 4,885,153, Cl. 424-1.100.

Jones, James F.: *See*—
Gallucci, Robert R.; Wroczynski, Ronald J.; Jones, James F.; and Rasch, Stefan F., 4,885,335, Cl. 525-67.000.

Jones, John R.: *See*—
Hess, Doren W., Jr.; and Jones, John R., 4,885,593, Cl. 343-786.000.

Jones, Timothy A.; Kaluza, Thomas J.; and Roach, Robert E., to Mobil Oil Corporation. Method and apparatus for measuring fluid flow parameters through naturally fractured media. 4,884,438, Cl. 73-153.000.

Jorge Gabrielli Zacharias Calixto: *See*—
Betti, Pier L., 4,884,381, Cl. 52-741.000.

Jorzyk, Sigurd; Scholl, Gerhard; Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, to Saarbergwerke Aktiengesellschaft. Cooling tower for the cooling water that drains/ from the condensor of a steam generator or the condensors/ of a plurality of steam generators. 4,885,011, Cl. 55-242.000.

Joshin Uramoto: *See*—
Uramoto, Joshin; Suzuki, Koichi; Oyama, Takuji; and Kojima, Hiroyasu, 4,885,068, Cl. 204-192.110.

Jostan, Josef L.: *See*—
Bogenschutz, August F.; Jostan, Josef L.; and Ostwald, Robert, 4,885,053, Cl. 156-635.000.

Jouguelet, Denis, to Automobiles Peugeot; and Automobiles Citroen. Mould for moulding of a foundry pattern and process for putting it into practice. 4,884,622, Cl. 164-45.000.

Joyce, Richard J.: *See*—
Eck, Robert E.; and Joyce, Richard J., 4,885,534, Cl. 324-158.00D.

Juki Corporation: *See*—
Asao, Hideo; Yamazi, Satoru; and Saibe, Seiichi, 4,884,517, Cl. 112-112.000.

Julian, Randall K., to Sunbeam Plastics Corporation. Tamper indicating container and closure. 4,884,706, Cl. 215-252.000.

Juliber, Curtis B.: *See*—
Pray, Robert H.; Ramler, Donald W.; and Juliber, Curtis B., 4,885,694, Cl. 364-464.010.

Junkins, George M.: *See*—
Zeiffer, Dieter F.; and Junkins, George M., 4,884,893, Cl. 366-176.000.

Juridical Foundation The Chemo-Sero-Therapeutic Research Institute: *See*—
Ginnaga, Akihiro; Nishihara, Tsukasa; Kawahara, Tetsuo; Susumi, Sadao; Mizokami, Hiroshi; and Sakoh, Mitsuo, 4,885,359, Cl. 530-396.000.

Jusa, Hidehiko: *See*—
Fukinuki, Takahiko; Hirano, Yasuhiro; Yoshigi, Hiroshi; and Jusa, Hidehiko, 4,885,631, Cl. 358-21.00R.

K & H Industries, Inc.: *See*—
Baake, Karl A., 4,885,670, Cl. 362-400.000.

K.J. Manufacturing: *See*—
Bedi, Ram, 4,884,660, Cl. 184-1.500.

Kabushiki Kaisha Hokkaido Nissin: *See*—
Emura, Tatuo; and Ohba, Kiyoshi, 4,885,178, Cl. 426-46.000.

Kabushiki Kaisha Murakoshi Seiko: *See*—
Masuda, Yoshinori, 4,884,316, Cl. 16-288.000.

Kabushiki Kaisha Nihon M.D.M.: *See*—
Watanabe, Yasuo; Yamakoshi, Kenichi; and Shimazu, Hideaki, 4,885,002, Cl. 604-9.000.

Kabushiki Kaisha P C Planning: *See*—
Nakazawa, Masahiro, 4,884,837, Cl. 294-158.000.

Kabushiki Kaisha Teisan Industries: *See*—
Ban, Keisuke; Sato, Masakazu; Fujito, Bakugo; and Kikuchi, Kousuke, 4,884,621, Cl. 164-4.100.

Kabushiki Kaisha Toshiba: *See*—
Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoaki; and Machida, Hironobu, 4,885,596, Cl. 346-157.000.
Hashimoto, Yasuichi, 4,885,645, Cl. 360-45.000.
Ikeda, Takashi; and Tsunoda, Euji, 4,884,934, Cl. 411-383.000.
Koshigoe, Shinpei; and Fujiwara, Takeshi, 4,885,505, Cl. 315-3.000.
Matsushita, Yoshiaki, 4,885,257, Cl. 437-11.000.
Shirakawa, Masakazu, 4,885,765, Cl. 379-93.000.
Tago, Nobuo, 4,885,544, Cl. 328-110.000.
Takagi, Shiro; Sato, Minoru; and Izawa, Koji, 4,885,704, Cl. 364-521.000.
Takahara, Kenichi; and Takahashi, Hiroshi, 4,885,490, Cl. 310-90.500.
Tanaka, Teruya; and Matsuo, Katsuharu, 4,885,456, Cl. 219-497.000.
Taniguchi, Hisaya, 4,885,445, Cl. 219-10.55B.
Taoda, Masami; and Machida, Hironobu, 4,885,699, Cl. 364-518.000.
Tsuneeda, Kenichi, 4,885,221, Cl. 430-100.000.
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Kitazume, Kiyoshi; Nakamura, Yasuharu; Ochiai, Hiromichi; and Nozaki, Hisashi, 4,885,185, Cl. 426-598.000.

Kachuk, Paul T., to Flint & Walling Industries, Inc. Governor and motor assembly. 4,885,440, Cl. 200-80.00R.

Kagata, Hiroshi: *See*—
Yokotani, Yoichiro; Kagata, Hiroshi; Niwa, Hiroshi; Kato, Junichi; and Mihara, Toshihiro, 4,885,661, Cl. 361-321.000.

Kagerer, Robert: *See*—
Schimmel, Johannes; Bauer, Harald; Burian, Gunther; Hulla, Heinz; Kagerer, Robert; and Kubin, Helmut, 4,885,690, Cl. 364-424.100.

Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Yoichi, to Kotobuki & Co., Ltd. Mechanical pencil. 4,884,910, Cl. 401-65.000.

Kahl, John J., Jr.; Vulpitta, Brian A.; Corbo, Thomas A.; Saunders, Craig M.; and Nottingham, John R., to Manco, Inc. Tape dispenser. 4,884,734, Cl. 225-26.000.

Kaiser, Danny K., to Delaware Capital Formation, Inc. Pressure monitoring device isolator. 4,884,452, Cl. 73-730.000.

Kajitani, Masayoshi: *See*—
Morita, Izuru; Kishitani, Keisuke; Kajitani, Masayoshi; Tozawa, Shoji; Satoh, Masanori; Otabe, Kisaburo; and Onda, Mamoru, 4,884,398, Cl. 60-274.000.

Kakuta, Takuya: *See*—
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 4,885,022, Cl. 71-86.000.

Kale, B. Michael: *See*—
Moore, James E.; Kale, B. Michael; Csanak, George; and Luty, Fritz, 4,884,855, Cl. 350-1.100.

Kaluza, Thomas J.: *See*—
Jones, Timothy A.; Kaluza, Thomas J.; and Roach, Robert E., 4,884,438, Cl. 73-153.000.

Kamata, Yoshiharu: *See*—
Nagatsuma, Nobuyoshi; and Kamata, Yoshiharu, 4,884,327, Cl. 29-235.000.

Kambayashi, Osamu: *See*—
Noto, Hiroshi; Hayashida, Nobuyuki; Kojima, Taketoshi; Ito, Makoto; and Kambayashi, Osamu, 4,885,580, Cl. 341-23.000.

Kambe, Takeshi: *See*—
Yamaguchi, Mikio; Watase, Yukihiro; Kambe, Takeshi; and Katou, Susumu, 4,885,023, Cl. 71-90.000.

Kamei, Masayuki: *See*—
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Kan, Kojiro: *See*—
Tominaga, Kaoru; Kan, Kojiro; Takata, Toshimasa; and Tomoshige, Toru, 4,885,329, Cl. 524-430.000.

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Kanamaru, Hisanobu: *See*—
Sawahata, Kazuo; and Kanamaru, Hisanobu, 4,884,427, Cl. 72-82.000.

Kandetzke, Steven M.: *See*—
Anderson, Herbert R., Jr.; Divakaruni, Renuka S.; Dynys, Joseph M.; Kandetzke, Steven M.; Kirby, Daniel P.; Master, Raj N.; and Casey, Jon A., 4,885,038, Cl. 156-89.000.

Kane, Mark E.; Shockley, James F.; and Eck, Henry H., to Pulse Electronics, Inc. Multilingual code receivers. 4,885,689, Cl. 364-424.010.

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Kantner, Robert C.: *See*—
Newkirk, Marc S.; Kantner, Robert C.; and Park, Eugene S., 4,884,737, Cl. 228-121.000.

Kao Corporation: *See*—
Sotoya, Kohshiro; Kubo, Makoto; Okabe, Kazuhiko; Tanigaki, Masanobu; Yamanishi, Masaji; and Hirota, Hajime, 4,885,112, Cl. 252-352.000.
Umemoto, Isao; Shimada, Fumiyo; and Mitsuno, Yuichiro, 4,885,109, Cl. 252-174.210.
Yamamura, Masaaki; Inokoshi, Junichi; Ito, Tetuo; Furuta, Kazumitsu; and Shimizu, Kazuo, 4,885,102, Cl. 252-8.800.

Kapadya, Aftab H.: *See*—
Gunderson, Charles; and Kapadya, Aftab H., 4,885,701, Cl. 364-520.000.

Kaper, Louris, to Douwe Egberts Koninklijke Tabaksfabriek-Koffiebranderijen-Theehandel, N.V. Process for decaffeinating green coffee. 4,885,181, Cl. 426-422.000.

Kaplinsky, George; and Allen, Ross R., to Hewlett-Packard Company. Multicomponent refillable toner delivery system. 4,885,595, Cl. 346-140.00R.

Kappler, Ulrich: *See*—
Hartung, Sigurd, deceased; Hartung-Merse, Birgit, heir; Beck, Uwe; Kappler, Ulrich; Mitschker, Alfred; and Grafe, Andreas, 4,885,418, Cl. 570-211.000.

Karakelle, Mutlu; and Zdrahala, Richard J., to Becton, Dickinson and Company. Composite membrane, method for its preparation and electrolyte sensor including same. 4,885,077, Cl. 204-403.000.

Karavaev, Alexandr A.: *See*—
Fedorov, Svyatoslav N.; Soloviev, Sergei A.; Degtev, Evgeny I.; Ivashina, Albina I.; and Karavaev, Alexandr A., 4,884,569, Cl. 128-305.000.

Karbach, Alfred; Schaub, Georg; and Peters, Rolf, to Metallgesellschaft Aktiengesellschaft. Method of controlling a combustion process yielding water vapor. 4,884,408, Cl. 60-667.000.

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Kari, Hanumath P.: *See*—
Vyas, Kamlesh P.; and Kari, Hanumath P., 4,885,314, Cl. 514-630.000.

Karino, Yoshiaki: *See*—
Tutamune, Hirotaka; Shiragai, Yasuo; Karino, Yoshiaki; and Wakasa, Yasuyuki, 4,884,698, Cl. 209-534.000.

Karius, Klaus D.: *See*—
Kruse, Heinz-Josef; Karius, Klaus D.; and Sippel, Achim, 4,884,508, Cl. 102-524.000.

Karrick, Gregory L.: *See*—
Wemple, James N.; Karrick, Gregory L.; and Spence, Floyd G., 4,885,386, Cl. 562-493.000.

Kasahara, Toshiharu: *See*—
Yamaguchi, Takahiro; Kasahara, Toshiharu; and Kosawa, Hiromi, 4,885,708, Cl. 364-553.000.

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Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoaki; and Machida, Hironobu, 4,885,596, Cl. 346-157.000.

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Stock, Werner; Baier, Manfred; Kaspar, Klaus P.; and Kirch, Peter, 4,885,255, Cl. 436-512.000.

Kaspar, Thomas C.: *See*—
Ankeny, Mark D.; Kaspar, Thomas C.; and Horton, Robert, Jr., 4,884,436, Cl. 73-38.000.

Kasuga, Takaharu: *See*—
Ono, Hiroshi; and Kasuga, Takaharu, 4,885,400, Cl. 568-454.000.

Kaszynski, Edwin G.: *See*—
Breuer, Miklos M.; Kaszynski, Edwin G.; Shander, Douglas; Usdin, Vera R.; and van der Lee, Hermes, 4,885,289, Cl. 514-170.000.

Katakami, Kazuhiko: *See*—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,885,644, Cl. 358-342.000.

Katakura, Kageyoshi: *See*—
Ogawa, Toshio; Nishiyama, Hisashi; Katakura, Kageyoshi; and Ishikawa, Shizuo, 4,884,448, Cl. 73-597.000.

Katanosaka, Naoki, to NEC Corporation. Semiconductor memory device with redundant memory cells. 4,885,721, Cl. 371-10.200.

Katayama Chemical Works Co., Ltd.: *See*—
Katayama, Sakae; Katayama, Hirohiko; Mukai, Toshihiko; and Kawasaki, Yoshinari, 4,885,136, Cl. 422-15.000.

Katayama, Hirohiko: *See*—
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Yokotani, Yoichiro; Kagata, Hiroshi; Niwa, Hiroshi; Kato, Junichi; and Mihara, Toshihiro, 4,885,661, Cl. 361-321.000.

Kato, Koji: *See*—
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Kato, Shinichi: *See*—
Kimura, Kenji; Hibino, Hiroki; Nisikori, Toshiaka; Ogiu, Hisao; Kidawara, Atsushi; Yabe, Hisao; Takamura, Koji; Yoshinaga, Jun; Kato, Shinichi; and Nakamura, Takeaki, 4,885,635, Cl. 358-98.000.

Kato, Yasushi: *See*—
Yoshioka, Keiichi; Watanabe, Kenji; and Kato, Yasushi, 4,885,215, Cl. 428-632.000.

Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, to Sumitomo Chemical Company, Limited. Method for in-mold polymerization of unsaturated compound. 4,885,125, Cl. 264-328.600.

Kato, Yoshiaki, to Canon Kabushiki Kaisha. Image communication apparatus. 4,885,641, Cl. 358-296.000.

Kato, Yoshitake, to Hitachi Maxell, Ltd. Disk cartridge with a hub having an outsert molded control ring. 4,885,653, Cl. 360-133.000.

Katoh, Kazuyuki, to Ricoh Company, Ltd. Device for feeding originals to a copying machine. 4,885,610, Cl. 355-233.000.

Katoh, Shunji: *See*—
Enoki, Shigekazu; Sawayama, Noboru; Katoh, Shunji; and Kimura, Noriyuki, 4,885,223, Cl. 430-122.000.

Katou, Susumu: *See*—
Yamaguchi, Mikio; Watase, Yukihiro; Kambe, Takeshi; and Katou, Susumu, 4,885,023, Cl. 71-90.000.

Katz, Danny. Vehicular back-up lamp alarm device. 4,885,567, Cl. 340-463.000.

Katz, Lawrence E.: *See*—
Pennington, B. Timothy; and Katz, Lawrence E., 4,885,412, Cl. 568-469.900.

Katzmann, Jerry A.: *See*—
Evans, Elizabeth L.; Gonchoroff, Nick J.; Greipp, Philip R.; Houck, David W.; Katzmann, Jerry A.; Kyle, Robert A.; and Loken, Michael R., 4,885,237, Cl. 435-6.000.

Kaufman, Leon: *See*—
Yao, Ching; Hale, James D.; Crooks, Lawrence E.; and Kaufman, Leon, 4,885,542, Cl. 324-313.000.

Kaufmann, Edward J.: *See*—
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Kautman, Frank W.: *See*—
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Kawabe, Yoshitaka: *See*—
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Kawachi, Toru: *See*—
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Kawada, Hiroyuki, to Sugiyasu Industries Co., Ltd. Lift for moving a container with castors. 4,884,936, Cl. 414-498.000.

Kawahara, Hiroshi: *See*—
Izaki, Takeshi; and Kawahara, Hiroshi, 4,884,501, Cl. 100-176.000.

Kawahara, Masato: *See*—
Ushikubo, Takashi; Okayama, Hideaki; Kawahara, Masato; and Asabayashi, Issei, 4,884,858, Cl. 350-96.130.

Kawahara, Tetsuo: *See*—
Ginnaga, Akihiro; Nishihara, Tsukasa; Kawahara, Tetsuo; Susumi, Sadao; Mizokami, Hiroshi; and Sakoh, Mitsuo, 4,885,359, Cl. 530-396.000.

Kawahara, Yosihiro: *See*—
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Kawai, Yoichi; Udagawa, Takatoshi; Imakita, Takeshi; and Yokote, Sachio, to Mitsui Toatsu Chemicals, Inc. Polyolefin resin compositions. 4,885,162, Cl. 424-83.000.
Kawakami, Hiroshi; and Igarashi, Akira, to Fuji Photo Film Co., Ltd. Heat-sensitive recording material. 4,885,271, Cl. 503-214.000.
Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katutomo; and Mukai, Norito, to Nippon CMK Corp. Printed circuit board. 4,885,431, Cl. 174-68.500.
Kawakami, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Radar transponder. 4,885,588, Cl. 342-51.000.
Kawamura, Hideo, to Isuzu Motors Limited. Turbocharger. 4,884,406, Cl. 60-605.300.
Kawarai, Takeshi: *See*—
Ichimura, Shigeru; Nakasuna, Seiko; Kawarai, Takeshi; Nishiyama, Takanori; and Toyoshima, Shuji, 4,885,643, Cl. 358-335.000.
Kawasaki, Josho, to Mitsui Ocean Development & Engineering Co., Ltd. Overload prevention apparatus for jacking system of offshore structures. 4,885,698, Cl. 364-506.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujita, Yoshitada; Hanada, Sadashi; and Yamamoto, Yoshiaki, 4,884,938, Cl. 414-541.000.
Kawasaki Steel Corp.: *See*—
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Murakami, Shinjiro, 4,885,071, Cl. 204-206.000.
Nishimoto, Shigeto; Fujimoto, Yoshiki; Inoue, Noriaki; and Harada, Shunji, 4,884,449, Cl. 73-660.000.
Yoshioka, Keiichi; Watanabe, Kenji; and Kato, Yasushi, 4,885,215, Cl. 428-632.000.
Kawasaki, Yoshinari: *See*—
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Kawata Chuck Manufacturing Co. Ltd.: *See*—
Kawata, Yasuyuki, 4,884,474, Cl. 74-813.00L.
Kawata, Ken: *See*—
Yamamoto, Soichiro; and Kawata, Ken, 4,885,224, Cl. 430-138.000.
Kawata, Yasuyuki, to Kawata Chuck Manufacturing Co. Ltd. Device for indexing. 4,884,474, Cl. 74-813.00L.
Kawawada, Naoki: *See*—
Yamamoto, Hiroyoshi; Takesue, Toshiharu; and Kawawada, Naoki, 4,884,859, Cl. 350-96.150.
Kay, D. Alan R.; and Wilson, William G. Method for providing oxygen ion vacancies in lanthanide oxides. 4,885,145, Cl. 423-230.000.
Kay, Joseph B., to Microspan Process Controls Limited. Testing apparatus. 4,884,463, Cl. 73-865.800.
Kayamori, Wataru: *See*—
Suzuki, Sunao; and Kayamori, Wataru, 4,885,656, Cl. 361-86.000.
Kazerooni, Homayoon, to University of Minnesota, Regents of the. Active compliant end-effector with force, angular position, and angular velocity sensing. 4,884,941, Cl. 414-744.500.
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McNamara, William J.; and Keane, Stephen, 4,884,342, Cl. 30-162.000.
Kedrin, Vladimir K.: *See*—
Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.
Keener, Richard A.: *See*—
Rice, Verle L.; and Keener, Richard A., 4,884,604, Cl. 144-84.000.
Keiswetter, Paul C. Co-extruded temporary seat cover for new vehicles. 4,884,839, Cl. 297-219.000.
Kelley, Thomas F., to Norfolk Scientific Inc. Partially transparent label. 4,884,827, Cl. 283-81.000.
Kelly, Carol; and Herrington, Linda. Plate stabilizer. 4,884,512, Cl. 108-26.000.
Kelly, George H., to J.A.C. Corporation. Closed system solvent stripping and reclaiming apparatus. 4,885,099, Cl. 210-771.000.
Kelly, William W., to Stanadyne Automotive Corp. Method and apparatus for regulating fuel injection timing and quantity. 4,884,549, Cl. 123-506.000.
Kelm, Walter H.; and Newland, Paul W., to Carboloy Inc. Device for locking a tool holder to a tool block. 4,884,483, Cl. 82-160.000.
Kemmer, Josef; and Lutz, Gerhard. Semiconductor element. 4,885,620, Cl. 357-24.000.
Kemp, David T.; and Bray, Peter. Hearing faculty testing. 4,884,447, Cl. 73-585.000.
Kemp, Preston B., Jr.; and Johnson, Walter A., to GTE Products Corporation. Process for producing fine copper flakes. 4,884,754, Cl. 241-5.000.
Kemp, Robert A.; Nelson, William I.; and Foley, Gary W., to General Chemical Corporation. Apparatus and method for transfer and slurrying or dissolving hydratable dry bulk chemicals. 4,884,925, Cl. 406-109.000.
Kendall, Steven S., to Genesee Polymers Corporation. Backhoe hammer. 4,884,641, Cl. 173-94.000.
Kenji, Sakakibara: *See*—
Hiroshi, Kawahara; and Kenji, Sakakibara, 4,885,602, Cl. 355-27.000.
Kenmochi, Kazuhito; Fukuhara, Akihiko; Komatu, Tomio; Kitahama, Masanori; Abe, Hideo; Kishida, Akira; Yanagishima, Fumiya; and Kobayashi, Makoto, to Kawasaki Steel Corp. Method and apparatus for preliminary treatment of stainless steel for cold rolling. 4,885,042, Cl. 148-12.00E.
Kerberenes, Jacques: *See*—
Lespagnol, Albert; Quinquis, Jean-Paul; and Kerberenes, Jacques, 4,885,744, Cl. 370-94.000.
Kerlin, Harold W.: *See*—
Fleming, David F.; Kerlin, Harold W.; Pauza, William V.; and Sheesley, Wilmer L., 4,884,982, Cl. 439-620.000.
Kern, Gerald N., to Kern, Gerald N. Anti-fungal methods and agent. 4,885,310, Cl. 514-547.000.
Kerr, Howard A.: *See*—
Bowers, Thomas E.; Frey, Alan E.; Kerr, Howard A.; Russell, Larry A.; and Stone, Roger E., 4,885,738, Cl. 370-58.100.
Kershaw, Peter; Meixner, Beo; and Olmstead, Gordon, to Magna International Inc. Double stage taumel gear reduction unit. 4,884,844, Cl. 297-362.000.
Kersten, Peter: *See*—
Hoffmann, Horst; Kersten, Peter; Volz, Hans; and Seyfried, Ulrich, 4,884,453, Cl. 73-776.000.
Keto, Gary A.: *See*—
Read, Edgar L.; Grant, Elwyn E.; Keto, Gary A.; Lin, Sharlene C.; Morgan, James D.; Nimon, Robert E.; Oldham, Oliver G.; Adams, Allen R., Jr.; and Salmones, Jose A., 4,885,739, Cl. 370-58.100.
Key Pharmaceuticals, Inc.: *See*—
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Kharchenko, Alexandr K.: *See*—
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Kida, Eiji: *See*—
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Kida, Yasushi: *See*—
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Kidawara, Atsushi: *See*—
Kimura, Kenji; Hibino, Hiroki; Nisikori, Toshiaka; Ogiu, Hisao; Kidawara, Atsushi; Yabe, Hisao; Takamura, Koji; Yoshinaga, Jun; Kato, Shinichi; and Nakamura, Takeaki, 4,885,635, Cl. 358-98.000.
Kiechel, Jean-Rene ; Acezat-Mispelter, Francoise; and Plas, Danielle, to Yamanouchi Pharmaceutical Co., Ltd. Nasal compositions. 4,885,305, Cl. 514-356.000.
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Tschang, Pin S.; Pham, Hieu T.; and Kieffer, Kenneth D., 4,885,597, Cl. 364-519.000.
Kikuchi, Kousuke: *See*—
Ban, Keisuke; Sato, Masakazu; Fujito, Bakugo; and Kikuchi, Kousuke, 4,884,621, Cl. 164-4.100.
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, to Tokyo Keiki Co. Ltd. Hyperthermia device. 4,884,580, Cl. 128-804.000.
Kimberly-Clark Corporation: *See*—
Lloyd, William D.; and Nuttal, David A., 4,885,202, Cl. 428-171.000.
Kimura, Kenji; Hibino, Hiroki; Nisikori, Toshiaka; Ogiu, Hisao; Kidawara, Atsushi; Yabe, Hisao; Takamura, Koji; Yoshinaga, Jun; Kato, Shinichi; and Nakamura, Takeaki, to Olympus Optical Co., Ltd. Endoscope light source apparatus. 4,885,635, Cl. 358-98.000.
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Nagai, Yasuo; Shimizu, Isao; Kimura, Masatoshi; Kaneko, Kenji; Okabe, Takeaki; and Sakamoto, Koozoo, 4,885,628, Cl. 357-68.000.
Kimura, Noriyuki: *See*—
Enoki, Shigekazu; Sawayama, Noboru; Katoh, Shunji; and Kimura, Noriyuki, 4,885,223, Cl. 430-122.000.
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Kinser, Ralph W., Jr.; Shriver, David L.; and Layman, Judith A., to Hewlett-Packard Company. Flexible printed circuit assembly with torsionly rotated conductors. 4,885,430, Cl. 174-254.000.
Kioritz Corporation: *See*—
Iida, Giichi; and Kodama, Taketomo, 4,884,535, Cl. 123-179.00P.
Kirby, Daniel P.: *See*—
Anderson, Herbert R., Jr.; Divakaruni, Renuka S.; Dynys, Joseph M.; Kandetzke, Steven M.; Kirby, Daniel P.; Master, Raj N.; and Casey, Jon A., 4,885,038, Cl. 156-89.000.
Kirby, Robert: *See*—
Christiansen, Hermann, 4,884,917, Cl. 405-80.000.
Kirch, Peter: *See*—
Stock, Werner; Baier, Manfred; Kaspar, Klaus P.; and Kirch, Peter, 4,885,255, Cl. 436-512.000.
Kirchler, Manfred. Cooling holder for hand-held whipped cream dispenser. 4,884,721, Cl. 222-146.600.
Kirihata, Yoshiko: *See*—
Kannagi, Reiji; Shigeta, Katsuyoshi; Ito, Yukishige; Kirihata, Yoshiko; and Ogawa, Tomoya, 4,885,358, Cl. 530-387.000.

Kiriyama, Tsutomu: *See*—
Yamamoto, Michio; Kiriyama, Tsutomu; Sasaki, Noriaki; Sakamoto, Yoshitaka; and Ishimaru, Kenji, 4,885,057, Cl. 162-9.000.

Kishida, Akira: *See*—
Kenmochi, Kazuhito; Fukuhara, Akihiko; Komatu, Tomio; Kitahama, Masanori; Abe, Hideo; Kishida, Akira; Yanagishima, Fumiya; and Kobayashi, Makoto, 4,885,042, Cl. 148-12.00E.

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Yada, Yukihiko; and Kishio, Toshiaki, 4,884,380, Cl. 52-208.000.

Kishitani, Keisuke: *See*—
Morita, Izuru; Kishitani, Keisuke; Kajitani, Masayoshi; Tozawa, Shoji; Satoh, Masanori; Otabe, Kisaburo; and Onda, Mamoru, 4,884,398, Cl. 60-274.000.

Kispert, Klaus; and Stolz, Robert, to SKF GmbH. Roller bearing executing swivel motions with device for the synchronous guidance of the bearing cage. 4,884,902, Cl. 384-550.000.

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Rabideau, Brian; Laughlin, William D.; Kissman, Kenneth; and Nicowski, Anthony T., 4,885,771, Cl. 379-354.000.

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Nakano, Yoshihito, 4,885,559, Cl. 336-92.000.

Kitahama, Masanori: *See*—
Kenmochi, Kazuhito; Fukuhara, Akihiko; Komatu, Tomio; Kitahama, Masanori; Abe, Hideo; Kishida, Akira; Yanagishima, Fumiya; and Kobayashi, Makoto, 4,885,042, Cl. 148-12.00E.

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Tsuchiya, Kikuo; Araki, Shingo; Inagaki, Masaji; Kudoh, Yumi; and Kitao, Teijiro, 4,885,270, Cl. 503-209.000.

Kitaoka, Hirokazu: *See*—
Hashimoto, Masanori; Yamamoto, Takeshi; Kawachi, Toru; Kuwashima, Junji; and Kitaoka, Hirokazu, 4,885,168, Cl. 424-95.000.

Kitazume, Kiyoshi; Nakamura, Yasuharu; Ochiai, Hiromichi; and Nozaki, Hisashi, to Kabushikikaisha Kibun. Method of making soybean milk. 4,885,185, Cl. 426-598.000.

Kitzsteiner, Friedrich: *See*—
Zeller, Rudolf; and Kitzsteiner, Friedrich, 4,884,348, Cl. 33-502.000.

Kiuchi, Kazuo: *See*—
Takahara, Hideyuki; and Kiuchi, Kazuo, 4,885,267, Cl. 501-134.000.

Kjelgaard, Tom, to Roby Teknik Aktiebolag. Packing container. 4,884,695, Cl. 206-631.200.

Klarquist, Thomas D.: *See*—
O'Brien, Dennis J.; Hanson, Paul G.; Klarquist, Thomas D.; Nepple, Bruce C.; Park, Michael C.; and Rosas, Robin R., 4,885,763, Cl. 379-67.000.

Klein, Frank H.; Selby, Steven F.; and Klueger, Sigmund, to Chrysler Motors Corporation. Lens structure for a vehicle radio or the like. 4,884,870, Cl. 350-319.000.

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Klein, Henry: *See*—
Kondziolka, Stanley; and Klein, Henry, 4,885,700, Cl. 364-519.000.

Klein Tools Inc.: *See*—
Simpson, David H., 4,884,589, Cl. 135-117.000.

Kleine, Peter; and Wechsler, Klaus, to Siemens Aktiengesellschaft. Housing for a chip card reader. 4,884,710, Cl. 220-4.00R.

Klenter, Otto; and Burk, Klaus, to Hoechst Aktiengesellschaft. End wall of moldable material for a wound roll. 4,884,690, Cl. 206-416.000.

Klimmer, Josef W.: *See*—
Hall, James W.; Popelier, Maurice A.; Klimmer, Josef W.; West, Neil L.; and Peters, Loren W., 4,884,994, Cl. 460-66.000.

Kljuev, Mikhail M.: *See*—
Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

Klopfenstein, Brent A.: *See*—
Metcalf, Jeffrey D.; and Klopfenstein, Brent A., 4,884,401, Cl. 60-403.000.

Klueger, Sigmund: *See*—
Klein, Frank H.; Selby, Steven F.; and Klueger, Sigmund, 4,884,870, Cl. 350-319.000.
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Knestele, Leopold. Shampooing apparatus for carpets and the like. 4,884,310, Cl. 15-3.000.

Knorr, Andreas: *See*—
Meyer, Horst; Schwenner, Eckhard; and Knorr, Andreas, 4,885,303, Cl. 514-332.000.

Knothe, Erich; and Melcher, Franz-Josef, to Sartorius GmbH. Precision balance with scale on top. 4,884,645, Cl. 177-180.000.

Knudsen, Finn B.: *See*—
Patino, Hugo; Heard, George E.; Knudsen, Finn B.; and Gress, H. Stephen, 4,885,184, Cl. 426-592.000.

Kobayashi, Makoto: *See*—
Kenmochi, Kazuhito; Fukuhara, Akihiko; Komatu, Tomio; Kitahama, Masanori; Abe, Hideo; Kishida, Akira; Yanagishima, Fumiya; and Kobayashi, Makoto, 4,885,042, Cl. 148-12.00E.

Kobayashi, Satoshi; and Kato, Koji, to Nissan Motor Co., Ltd.; Nissan Shatai Company, Limited; Ohi Seisakusho Co., Ltd.; and Fuji Kiko Co., Ltd. Automatic transmission shift control device. 4,884,668, Cl. 192-4.00A.

Kobayashi, Takehiro: *See*—
Yasuoka, Norio; Kobayashi, Takehiro; Hikida, Nobuharu; Hatakeyama, Yasuyuki; Aoto, Yoshiyuki; and Itogawa, Jiro, 4,885,766, Cl. 379-105.000.

Kobayashi, Toyohiko: *See*—
Yamada, Nobuo; and Kobayashi, Toyohiko, 4,885,274, Cl. 512-16.000.

Kobishi Electric Co., Ltd.: *See*—
Iwata, Keisuke; and Kojima, Yoshikazu, 4,885,572, Cl. 340-425.500.

Kobos, Robert K.: *See*—
Eveleigh, John William d.; and Kobos, Robert K., 4,885,250, Cl. 435-181.000.

Kochiev, Valery K.: *See*—
Ksovreli, Robinzon I.; Didebulidze, Alexandr K.; Kochiev, Valery K.; and Gasseev, Amiran F., 4,885,487, Cl. 310-36.000.

Kock, Ronald W.: *See*—
Kolodesh, Michael S.; Cash, Walter, Jr.; Davis, Jerry E.; Gosselin, Peter G.; Kock, Ronald W.; Pierson, Bruce A.; Reiboldt, H. Norman; Sabatelli, David A.; and Toms, Douglas, 4,885,182, Cl. 426-482.000.

Kodama, Minekazu: *See*—
Hani, Kiyoshi; Takei, Takako; Kodama, Minekazu; and Watanabe, Takahiko, 4,885,058, Cl. 162-145.000.

Kodama, Taketomo: *See*—
Iida, Giichi; and Kodama, Taketomo, 4,884,535, Cl. 123-179.00P.

Koenck, Steven E., to Norand Corporation. Battery conditioning system having communication with battery parameter memory means in conjunction with battery conditioning. 4,885,523, Cl. 320-21.000.

Koenig, Jean-Jacques: *See*—
Jarreau, Francois-Xavier; and Koenig, Jean-Jacques, 4,885,280, Cl. 514-26.000.

Koenig, Timothy A., to Minnesota Mining and Manufacturing Company. Process for coating electrical bus bars and the like. 4,885,187, Cl. 427-58.000.

Koester, Claus: *See*—
Konrath, Karl; Koester, Claus; Zibold, Karl; Schwarz, Manfred; Russeler, Karl-Friedrich; Krieger, Klaus; and Kupzik, Roland, 4,884,542, Cl. 123-370.000.

Kofod, Mogens, to Minnesota Mining and Manufacturing Company. Fiber optic fan-out module. 4,884,862, Cl. 350-96.200.

Kofol, J. Stephen; and Schroepfer, Daniel A. Electronically steerable antenna. 4,885,592, Cl. 343-754.000.

Koga, Hidetaka, to Isuzu Motors Ltd. Automatic change gear control means. 4,884,667, Cl. 192-3.550.

Kohno, Osamu: *See*—
Sugimoto, Mamoru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Aoki, Shin'ya; and Nakagawa, Mikio, 4,885,273, Cl. 505-1.000.

Koichi, Yasushi; Mizuishi, Haruzi; Funaki, Mutuko; and Fujioka, Tetsuya, to Ricoh Company, Ltd. Corona wire cleaning device utilizing a position detection system. 4,885,466, Cl. 250-324.000.

Koichi, Yasushi: *See*—
Satoh, Tsumori; and Koichi, Yasushi, 4,885,612, Cl. 355-305.000.

Koito Seisakusho Co., Ltd.: *See*—
Nino, Naohi, 4,885,669, Cl. 362-346.000.

Kojima, Hiroyasu: *See*—
Uramoto, Joshin; Suzuki, Koichi; Oyama, Takuji; and Kojima, Hiroyasu, 4,885,068, Cl. 204-192.110.

Kojima, Keiji; Torii, Shunichi; and Sakata, Akiharu, to Hitachi, Ltd. Vector processor for processing database without special tags for vector elements. 4,885,678, Cl. 364-200.000.

Kojima, Taketoshi: *See*—
Noto, Hiroshi; Hayashida, Nobuyuki; Kojima, Taketoshi; Ito, Makoto; and Kambayashi, Osamu, 4,885,580, Cl. 341-23.000.

Kojima, Yoshikazu: *See*—
Iwata, Keisuke; and Kojima, Yoshikazu, 4,885,572, Cl. 340-425.500.

Kolln Bernd; and Grun, Rudiger, to Ludwig Riedhammer Gmbh. Tunnel kiln. 4,884,969, Cl. 432-133.000.

Kolodesh, Michael S.; Cash, Walter, Jr.; Davis, Jerry E.; Gosselin, Peter G.; Kock, Ronald W.; Pierson, Bruce A.; Reiboldt, H. Norman; Sabatelli, David A.; and Toms, Douglas, to Proctor & Gamble Company, The. Method of and apparatus for extracting juice and meat from a fruit. 4,885,182, Cl. 426-482.000.

Kolton, Chester; and Spater, Stuart S., to B & G Plastics, Inc. Hanger for supporting plural garments. 4,884,726, Cl. 223-91.000.

Komaru, Masaki: *See*—
Tomoda, Toshimasa; Badono, Shinji; and Komaru, Masaki, 4,885,759, Cl. 378-53.000.

Komatsu, Yasuaki: *See*—
Tanaka, Hideshi; Yagi, Kazuyuki; Tanimoto, Shigeru; Komatsu, Yasuaki; Yanagawa, Koichi; and Kuboyama, Yoichi, 4,885,528, Cl. 324-57.00R.

Komatu, Tomio: *See*—
Kenmochi, Kazuhito; Fukuhara, Akihiko; Komatu, Tomio; Kitahama, Masanori; Abe, Hideo; Kishida, Akira; Yanagishima, Fumiya; and Kobayashi, Makoto, 4,885,042, Cl. 148-12.00E.

Komori, Akihiro; and Hirano, Muneyoshi, to Yoshida Kogyo K. K. Sash assembly with built-in blind. 4,884,613, Cl. 160-107.000.

Komoto, Yasuhiko, to NEC Corporation. Microprogram controller for detecting the occurrence of an interrupt request or a termination of a string instruction. 4,885,682, Cl. 364-200.000.

Kondo, Masami: *See—*
Fujitani, Makoto; Hirabayashi, Masashi; Honda, Hideo; Machida, Hiroshi; Kondo, Masami; and Onoda, Sachio, 4,884,956, Cl. 418-15.000.

Kondziolka, Stanley; and Klein, Henry, to Demco Bingo Inc. Computer-controlled method and apparatus for making bingo cards. 4,885,700, Cl. 364-519.000.

Konica Corporation: *See—*
Kaneko, Tadashi; Shirose, Meizo; and Yamamoto, Yoko, 4,885,222, Cl. 430-102.000.
Watanabe, Satoshi, 4,885,672, Cl. 363-21.000.

Konishi, Hirokazu: *See—*
Yamamoto, Taizo; and Konishi, Hirokazu, 4,884,602, Cl. 141-242.000.

Konopka, John G., to Zenith Electronics Corporation. Constant current source and battery charger. 4,885,522, Cl. 320-21.000.

Konovalenko, Vladimir V.: *See—*
Budyko, Viktor A.; Ivanchenko, Andrei F.; Krokhmal, Vladimir M.; Konovalenko, Vladimir V.; Nechvolodov, Georgy V.; Lastochkin, Boris N.; and Kutsov, Valentin D., 4,885,654, Cl. 361-13.000.

Konrath, Karl; Koester, Claus; Zibold, Karl; Schwarz, Manfred; Russeler, Karl-Friedrich; Krieger, Klaus; and Kupzik, Roland, to Robert Bosch GmbH. Fuel-injection pump for internal combustion engines, in particular for diesel engines. 4,884,542, Cl. 123-370.000.

Kopatz, Nelson E.; Johnson, Walter A.; Vanderpool, Jack E.; and Shaw, Howard H., to GTE Products Corporation. Process for producing prealloyed tungsten alloy powders. 4,885,028, Cl. 75-0.5BB.

Kopf, Henry B. Apparatus for mass transfer involving biological/pharmaceutical media. 4,885,087, Cl. 210-321.720.

Kopin Corporation: *See—*
Fan, John C. C.; Zavracky, Paul M.; Narayan, Jagdish; Allen, Lisa P.; and Vu, Duy-Phach, 4,885,052, Cl. 156-620.700.

Korobkov, Vladlen V.: *See—*
Fadeev, Petr Y.; Fadeev, Vladimir Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; and Ermilov, Nikolai P., 4,884,642, Cl. 173-139.000.

Korobkova, Ljudmila S., administrator: *See—*
Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

Kosai, Kenneth, to Santa Barbara Research Center. HgCdTe MIS device having a CdTe heterojunction. 4,885,619, Cl. 357-24.000.

Kosar, Kaya A.: *See—*
Baheti, Ram J.; McGuire, Dennis P.; and Kosar, Kaya A., 4,884,656, Cl. 181-207.000.

Kosawa, Hiromi: *See—*
Yamaguchi, Takahiro; Kasahara, Toshiharu; and Kosawa, Hiromi, 4,885,708, Cl. 364-553.000.

Koshigoe, Shinpei; and Fujiwara, Takeshi, to Kabushiki Kaisha Toshiba. Electron gun assembly. 4,885,505, Cl. 315-3.000.

Kotilainen, Risto M.; and Lilius, Kaj R., to Suomen Calcusan Oy-Finska Calcussan AB. Mouthwash solution. 4,885,156, Cl. 424-54.000.

Kotobuki & Co., Ltd.: *See—*
Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Yoichi, 4,884,910, Cl. 401-65.000.

Koujiya, Miyuki: *See—*
Miyamoto, Noritaka; Koujiya, Miyuki; Miyake, Joji; Iomoda, Takashi; Ohsawa, Hidetoshi; and Nagami, Tetsuo, 4,885,213, Cl. 428-612.000.

Kouno, Katsumi, to Toyota Jidosha Kabushiki Kaisha. Method of controlling a four wheel drive vehicle. 4,884,653, Cl. 180-233.000.

Kousaka, Tomomi: *See—*
Ozawa, Akira; Kousaka, Tomomi; Suzuki, Hideo; and Murakami, Masatoshi, 4,884,332, Cl. 29-568.000.

Kovarik, David P.: *See—*
Amos, Michael D.; Kovarik, David P.; and Kub, George F., Jr., 4,885,452, Cl. 219-130.400.

Kovis, Michael: *See—*
Bunting, Earl L.; and Kovis, Michael, 4,885,795, Cl. 455-5.000.

Kowarik, Oskar: *See—*
Hoffmann, Kurt; Oberle, Hans-Dieter; Kraus, Rainer; Kowarik, Oskar; and Paul, Manfred, 4,885,748, Cl. 371-21.300.

Koyama, Shuntaro: *See—*
Miyamoto, Tomohiko; Koyama, Shuntaro; Tomuro, Jinichi; Morihara, Atsushi; Yamashita, Hisao; Takahashi, Sadao; Kida, Eiji; Ueda, Akio; and Takamoto, Shigehito, 4,884,396, Cl. 60-39.120.

Koyo Seiko Co., Ltd: *See—*
Nishimoto, Shigeto; Fujimoto, Yoshiki; Inoue, Noriaki; and Harada, Shunji, 4,884,449, Cl. 73-660.000.

Kraft, Inc.: *See —*
Soucie, William G.; Chen, Wen-Sherng; Witte, Vernon C.; Henry, George A.; and Drehkoff, William D., 4,885,179, Cl. 426-104.000.

Strandholm, John J.; Prochnow, Robert R.; Miller, Mark S.; Woodford, Lawrence E.; and Neunaber, Steven M., 4,885,183, Cl. 426-582.000.

Kraft, Kurt R., to Boeing Company, The. Cantilevered vortex control device. 4,884,772, Cl. 244-199.000.

Kralovic, Raymond C., to Steris Corporation. Universal biological indicator system. 4,885,253, Cl. 435-296.000.

Kramer, Andreas; and Perritaz, Francis, to Ciba-Geigy Corporation. Mixture containing dicyanate or polycyanate compound, substituted bicyclo[2.2.1]hept-5-ene-2,3-dicarboximide and thermoplastic. 4,885,346, Cl. 525-426.000.

Kraus, Rainer: *See—*
Hoffmann, Kurt; Oberle, Hans-Dieter; Kraus, Rainer; Kowarik, Oskar; and Paul, Manfred, 4,885,748, Cl. 371-21.300.

Krausse, Howard: *See—*
Eberbach, Steven J., 4,885,782, Cl. 381-186.000.

Kreibiehl, Guenter: *See—*
Graalmann, Onno; Kreibiehl, Guenter; Turznik, Gerhard; and Weber, Heinz, 4,885,206, Cl. 428-316.600.

Kreikebaum, Gerhard: *See—*
Shofner, Frederick M.; Miller, Arthur C., Jr.; and Kreikebaum, Gerhard, 4,885,473, Cl. 250-574.000.

Kreth, Wolfgang; and Griebler, Wolf-Dieter, to Metallgesellschaft Aktiengesellschaft. Method of making a composite TiO_2 pigment. 4,885,034, Cl. 106-449.000.

Kriechbaum, Karl, to AEG Aktiengesellschaft. Contact element. 4,885,442, Cl. 200-144.00B.

Krieger, Klaus: *See—*
Konrath, Karl; Koester, Claus; Zibold, Karl; Schwarz, Manfred; Russeler, Karl-Friedrich; Krieger, Klaus; and Kupzik, Roland, 4,884,542, Cl. 123-370.000.

Krochta, John M., to United States of America, Agriculture. Production of high yields of glycolic and oxalic acids from polysaccharide-containing materials. 4,885,387, Cl. 562-515.000.

Krokaugger, William G., to Mole-Richardson Company. System for controlling the intensity of high power lights. 4,885,508, Cl. 315-287.000.

Krokhmal, Vladimir M.: *See—*
Budyko, Viktor A.; Ivanchenko, Andrei F.; Krokhmal, Vladimir M.; Konovalenko, Vladimir V.; Nechvolodov, Georgy V.; Lastochkin, Boris N.; and Kutsov, Valentin D., 4,885,654, Cl. 361-13.000.

Krumeich, Jorg H.; and Quast, Norbert, to EyeTech AG. Device for retaining a disc obtained from a human cornea. 4,884,570, Cl. 128-305.000.

Kruse, Heinz-Josef; Karius, Klaus D.; and Sippel, Achim, to Rheinmetall GmbH. Spin stabilized carrier projectile equipped with a driving band. 4,884,508, Cl. 102-524.000.

Ksovreli, Robinzon I.; Didebulidze, Alexandr K.; Kochiev, Valery K.; and Gasseev, Amiran F., to Gruzinsky Selskokhozyaistvenny Institut. Electromagnetic oscillation motor. 4,885,487, Cl. 310-36.000.

Kub, George F., Jr.: *See—*
Amos, Michael D.; Kovarik, David P.; and Kub, George F., Jr., 4,885,452, Cl. 219-130.400.

Kubiak, Kenneth F., to Occidental Chemical Corporation. Method for the decoloration of chloro-xylene compositions. 4,885,417, Cl. 570-211.000.

Kubin, Helmut: *See—*
Schimmel, Johannes; Bauer, Harald; Burian, Gunther; Hulla, Heinz; Kagerer, Robert; and Kubin, Helmut, 4,885,690, Cl. 364-424.100.

Kubo, Makoto: *See—*
Sotoya, Kohshiro; Kubo, Makoto; Okabe, Kazuhiko; Tanigaki, Masanobu; Yamanishi, Masaji; and Hirota, Hajime, 4,885,112, Cl. 252-352.000.

Kubo, Minoru: *See—*
Ban, Yuzaburo; Manno, Masaya; Kubo, Minoru; Morisaki, Mototsugu; and Ogura, Mototsugu, 4,885,260, Cl. 437-81.000.

Kubo, Takashige: *See—*
Umeno, Hidenori; Kubo, Takashige; Hagiwara, Nobutaka; Sato, Hiroaki; and Sawamoto, Hideo, 4,885,681, Cl. 364-200.000.

Kubono, Tadashi: *See—*
Suzuki, Kunio; Takamura, Masayuki; and Kubono, Tadashi, 4,884,623, Cl. 164-129.000.

Kubota, Ltd.: *See—*
Nozaka, Kenkichi; Kawahara, Yosihiro; and Fukutaka, Takashi, 4,884,639, Cl. 172-47.000.

Kuboyama, Yoichi: *See—*
Tanaka, Hideshi; Yagi, Kazuyuki; Tanimoto, Shigeru; Komatsu, Yasuaki; Yanagawa, Koichi; and Kuboyama, Yoichi, 4,885,528, Cl. 324-57.00R.

Kuchta, Richard: *See—*
Vaida, Robert M.; Osthus, Harold L.; and Kuchta, Richard, 4,884,510, Cl. 104-91.000.

Kuchuk-Yatsenko, Sergei I.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Kharchenko, Alexandr K.; and Unigovsky, Mikhail R., 4,885,450, Cl. 219-101.000.

Kudoh, Kunio, to Ricoh Company, Ltd. Device applicable to an image recording apparatus for feeding a recording medium. 4,885,613, Cl. 355-310.000.

Kudoh, Yumi: *See—*
Tsuchiya, Kikuo; Araki, Shingo; Inagaki, Masaji; Kudoh, Yumi; and Kitao, Teijiro, 4,885,270, Cl. 503-209.000.

Kuhlman Corporation: *See—*
Hamkins, Clark J., 4,884,758, Cl. 242-4.0BE.

Kuhlmann, Ludwig: *See*—
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Fadeev, Petr Y.; Fadeev, Vladimir Y.; Korobkov, Vladlen V.; Kulagin, Rim A.; and Ermilov, Nikolai P., 4,884,642, Cl. 173-139.000.

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Asano, Kiro; Matsudaira, Tadahiro; Tamura, Humio; Suzuki, Toichi; and Wada, Hisayuki, 4,885,290, Cl. 514-182.000.

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Ueha, Sadayuki; Kurosawa, Minoru; and Masuda, Michiyuki, 4,885,499, Cl. 310-328.000.

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Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

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Evans, Elizabeth L.; Gonchoroff, Nick J.; Greipp, Philip R.; Houck, David W.; Katzmann, Jerry A.; Kyle, Robert A.; and Loken, Michael R., 4,885,237, Cl. 435-6.000.

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Noto, Hiroshi; Hayashida, Nobuyuki; Kojima, Taketoshi; Ito, Makoto; and Kambayashi, Osamu, 4,885,580, Cl. 341-23.000.

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Miner, Jonathan L.; Lacher, Vernon R.; Rescigno, Gerald J.; Swim, William B.; Gierke, Martin P.; and Hahn, David A., 4,884,314, Cl. 15-344.000.

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Rendahl, Roy; and Steele, Edward L., 4,884,792, Cl. 269-236.000.

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Lamont, Mark D., to Undersea Industries, Inc. Snorkel. 4,884,564, Cl. 128-201.110.

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Novis, Ari M.; Adams, Don L.; LaMontagne, Troy J.; and Sivahop, Albert, 4,885,514, Cl. 318-580.000.

Lancaster, Gerald M.: *See*—
Pham, Tu-Anh; and Lancaster, Gerald M., 4,885,315, Cl. 521-50.500.

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Chupka, David E.; and Landegger, Carl C., 4,885,090, Cl. 210-497.010.

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Jhaveri, Satish S.; Dunnavant, William R.; and Langer, Heimo J., 4,884,620, Cl. 164-15.000.

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Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; White, Danny R.; and Johnson, William B., 4,885,130, Cl. 419-12.000.
Newkirk, Marc S.; Kantner, Robert C.; and Park, Eugene S., 4,884,737, Cl. 228-121.000.
Newkirk, Marc S., 4,885,131, Cl. 919-12.000.

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Hofmeister, Helmut; Laurent, Henry; and Wiechert, Rudolf, 4,885,117, Cl. 260-397.450.

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Kinser, Ralph W., Jr.; Shriver, David L.; and Layman, Judith A., 4,885,430, Cl. 174-254.000.

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Thornley, David J.; Smith, Moira A.; Dale, Philip; Leask, Samuel H.; and Coutts, Ian M., 4,884,368, Cl. 49-276.000.

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Vercellotti, Leonard C.; Anderson, Arthur A.; Christiansen, David A.; Johnson, Dannis R.; Brickner, Laurence R.; Colclaser III, Robert G.; and Leddy, John G., 4,885,564, Cl. 340-310.00A.

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Cormier, Michel J. N.; Ledger, Philip W.; Amkraut, Alfred; and Marty, Jean P., 4,885,154, Cl. 424-10.000.

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Sharp, David P.; Lee, Charles H.; and Cassidy, Thomas, 4,885,482, Cl. 307-465.000.

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Magnuson, Robert E., 4,884,898, Cl. 384-58.000.

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Kotilainen, Risto M.; and Lilius, Kaj R., 4,885,156, Cl. 424-54.000.

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Miyake, Miyuki; Toda, Haruhiko; and Yasu, Minako, 4,885,159, Cl. 424-70.000.

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Bally, Marcel B.; Loughrey, Helen; and Cullis, Pieter R., 4,885,172, Cl. 424-417.000.
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Little, Wendell L., to Dallas Semiconductor Corporation. High speed carry chain. 4,885,716, Cl. 364-786.000.
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Gueret, Jean-Louis H., 4,884,912, Cl. 401-78.000.
Manoury, Philippe; and Grollier, Jean F., 4,885,296, Cl. 514-252.000.
Sebag, Henri, 4,885,402, Cl. 568-620.000.
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Varga, Ljubomir D.; and Losic, Novica A., 4,885,674, Cl. 363-21.000.
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Bally, Marcel B.; Loughrey, Helen; and Cullis, Pieter R., 4,885,172, Cl. 424-417.000.
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Constant, W. David; Wolcott, Joanne M.; and Cambridge, Vivian J., 4,884,437, Cl. 73-54.000.
Lovik, Craig J. Luminescent balloon and method of manufacture thereof. 4,884,990, Cl. 446-220.000.
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Lowndes, William, III; Gay, Francis V., II; and Gay, Benjamin A., 4,884,958, Cl. 425-62.000.
Lowndes, William, III; Gay, Francis V., II; and Gay, Benjamin A., to Lowndes Corporation. Apparatus for setting up and pouring concrete forms. 4,884,958, Cl. 425-62.000.
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Ahlquist, Paul G., 4,885,248, Cl. 435-172.300.
Larkins, Brian; Cuellar, Richard E.; and Wallace John C., 4,885,357, Cl. 530-373.000.
Lucas, Bohumir: *See*—
Baschang, Gerhard; Hartmann, Albert; Hirt, Hans; Lucas, Bohumir; and Wirz, Peter, 4,885,285, Cl. 514-114.000.
Lucas Industries Public Limited Company: *See*—
Campbell, Roy; and Price, Anthony G., 4,884,494, Cl. 92-129.000.
Colgate, Brian M., 4,884,404, Cl. 60-581.000.
Lucas, Keith, to Scientific-Atlanta, Inc. Information display scheme for subscribers of a subscription television system. 4,885,775, Cl. 380-10.000.
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Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.
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Parker, Jeffrey R., 4,885,663, Cl. 362-32.000.
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Moore, James E.; Kale, B. Michael; Csanak, George; and Luty, Fritz, 4,884,855, Cl. 350-1.100.
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Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G., 4,885,414, Cl. 570-130.000.
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Kemmer, Josef; and Lutz, Gerhard, 4,885,620, Cl. 357-24.000.
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En-Jian, Chen; Zhaorong, Lin; and Ly-ying, Chen, 4,884,628, Cl. 165-104.270.
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Bachmann, Peter K.; Geittner, Peter E.; Lydtin, Hans-Jurgen; and Romanowski, Gerd, 4,885,018, Cl. 65-3.110.
Lyle, Robert E., Jr.: *See*—
McMahon, William A., Jr.; Trujillo, David A.; and Lyle, Robert E., Jr., 4,885,327, Cl. 524-376.000.
Lynes Holding S.A.: *See*—
Debetencourt, Jean, 4,884,705, Cl. 215-250.000.
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Rich, Douglas A.; Rick, Paul N.; Bournias, James N.; and Lyons, Robert E., 4,885,010, Cl. 55-241.000.
M. K. Products: *See*—
Martin, Donald L., 4,885,453, Cl. 219-136.000.
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Mabey, Kent W.; Boska, Joseph M.; and Richards, Stephen L., to AGB Television Research. System and methods for monitoring TV viewing system including a VCR and/or a cable converter. 4,885,632, Cl. 358-84.000.
Macey, Laurence D., to Macey Mining Services Pty. Ltd. Apparatus for testing multiphase outlet with visual indication of phase energization, phase rotation, and supply voltage. 4,885,532, Cl. 324-133.000.
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Macey, Laurence D., 4,885,532, Cl. 324-133.000.
Machida, Hironobu: *See*—
Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoaki; and Machida, Hironobu, 4,885,596, Cl. 346-157.000.
Taoda, Masami; and Machida, Hironobu, 4,885,699, Cl. 364-518.000.
Machida, Hiroshi: *See*—
Fujitani, Makoto; Hirabayashi, Masashi; Honda, Hideo; Machida, Hiroshi; Kondo, Masami; and Onoda, Sachio, 4,884,956, Cl. 418-15.000.
Machin, Peter J.: *See*—
Broadhurst, Michael J.; Handa, Balraj K.; Johnson, William H.; Lawton, Geoffrey; and Machin, Peter J., 4,885,283, Cl. 514-78.000.
Machine Technology, Inc.: *See*—
Hillman, Gary, 4,885,075, Cl. 204-298.000.
Mackintosh, Christine: *See*—
Paffhausen, Hans; Hogarth, Ian; Scott, Andrew; and Mackintosh, Christine, 4,884,908, Cl. 400-241.200.
Mader, Frederick W., to Du Pont de Nemours, E. I., and Company. Fluorination process. 4,885,416, Cl. 570-170.000.
Madokoro, Manabu: *See*—
Ikeuchi, Hisaaki; Madokoro, Manabu; Sato, Haruo; and Jodoi, Takashi, 4,885,123, Cl. 376-233.000.
Maeda, Akira: *See*—
Inaba, Shigemitsu; Ootaka, Kazuto; and Maeda, Akira, 4,884,978, Cl. 439-352.000.
Maehara, Toshifumi, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Hydraulic power booster. 4,884,492, Cl. 91-370.000.
Mag Instrument, Inc.: *See*—
Maglica, Anthony; and Johnson, Ralph E., 4,885,668, Cl. 362-345.000.
Magara, Takuji: *See*—
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Maglica, Anthony; and Johnson, Ralph E., to Mag Instrument, Inc. Heat shield. 4,885,668, Cl. 362-345.000.
Magna International Inc.: *See*—
Kershaw, Peter; Meixner, Beo; and Olmstead, Gordon, 4,884,844, Cl. 297-362.000.
Magnuson, Robert E., to Lee Controls, Inc. Linear motion pillow block including fine tuning features. 4,884,898, Cl. 384-58.000.

Mahabadi, John K., to Motorola, Inc. Power-on reset circuit. 4,885,476, Cl. 307-272.300.

Maher, Joseph A.; Vowles, E. John; Napoli, Joseph D.; Zafiropoulo, Arthur W.; and Miller, Mark W., to General Signal Corporation. Quad processor. 4,885,050, Cl. 156-345.000.

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Wurtman, Richard J.; and Maher, Timothy J., 4,885,312, Cl. 514-561.000.

Mainiero, John W. Roll forming apparatus for forming barbed tape into a coded configuration. 4,884,425, Cl. 72-9.000.

Maitan, Gianni: *See*—
Corain, Luciano; Maitan, Gianni; and Valsecchi, Enrico, 4,884,598, Cl. 139-371.000.

Majewski, Philippe: *See*—
Le Gac, Jean-Yves; Devilleger, Denis; and Majewski, Philippe, 4,884,633, Cl. 166-75.100.

Maki, Toshiya. Pulverizing method. 4,884,753, Cl. 241-3.000.

Malanga, Michael T.: *See*—
Traugott, Thomas D.; Moore, Eugene R.; and Malanga, Michael T., 4,885,339, Cl. 525-132.000.

Maloizel, Christian: *See*—
George, Pascal; Sevrin, Mireille; and Maloizel, Christian, 4,885,302, Cl. 514-307.000.

Malpass, Dennis B.: *See*—
Piotrowski, Andrzej M.; and Malpass, Dennis B., 4,885,406, Cl. 568-716.000.

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Fergason, James L., 4,884,873, Cl. 350-334.000.
Fergason, James L., 4,884,877, Cl. 350-351.000.

Manco, Inc.: *See*—
Kahl, John J., Jr.; Vulpitta, Brian A.; Corbo, Thomas A.; Saunders, Craig M.; and Nottingham, John R., 4,884,734, Cl. 225-26.000.

Mandel, Sheldon W.; and Banerjee, Chinmoy, to Maytag Corporation. Heat transfer barrier for the yoder loop of a refrigerator cabinet. 4,884,415, Cl. 62-277.000.

Manderson, William: *See*—
Smith, Garry D. F.; and Manderson, William, 4,884,935, Cl. 414-498.000.

Manifattura Lane Gaetano Marzotto & Figli S.P.A.: *See*—
Marzotto, Gaetano, 4,884,325, Cl. 28-160.000.

Manke, Steven A.: *See*—
Rothgery, Eugene F.; and Manke, Steven A., 4,885,316, Cl. 521-90.000.

Mannesmann AG: *See*—
Lange, Ernst W.; Scholl, Karl; and Vespermann, Dieter, 4,884,708, Cl. 220-3.000.

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Pleschiutschnigg, Fritz-Peter; Von Schnakenburg, Joachim; Parschat, Lothar; and Stadler, Peter, 4,884,624, Cl. 164-454.000.

Manno, Masaya: *See*—
Ban, Yuzaburo; Manno, Masaya; Kubo, Minoru; Morisaki, Mototsugu; and Ogura, Mototsugu, 4,885,260, Cl. 437-81.000.

Manoury, Philippe; and Grollier, Jean F., to L'Oreal. 1-piperazinyl-pyrimidine derivatives and application thereof in therapeutics and cosmetics. 4,885,296, Cl. 514-252.000.

Marchand, Sam R.: *See*—
Bays, F. Barry; Trott, Arthur F.; and Marchand, Sam R., 4,884,572, Cl. 128-334.00R.

Marconi Company Limited, The: *See*—
Thornley, David J.; Smith, Moira A.; Dale, Philip; Leask, Samuel H.; and Coutts, Ian M., 4,884,368, Cl. 49-276.000.

Marfat, Anthony, to Pfizer Inc. Synthetic method for indol-2(3H)-ones. 4,885,370, Cl. 548-486.000.

Marguinaud, Andre : *See*—
Fontanes, Sylvain; Birot, Patrice; Marguinaud, Andre ; Quignon, Thierry; and Romann, Brigitte, 4,885,756, Cl. 375-82.000.

Marhold, Albrecht; and Fischer, Reiner, to Bayer Aktiengesellschaft. 2-methyl-4-fluoro-phenols and their preparation. 4,885,388, Cl. 564-417.000.

Marhold, Albrecht; and Braden, Rudolf, to Bayer Aktiengesellschaft. Process for the preparation of benzotrifluorides which are substituted by fluorine and optionally in addition by chlorine. 4,885,415, Cl. 570-144.000.

Marinaccio, Richard E.: *See*—
Wiegand, Richard J.; Buerger, Peter M.; and Marinaccio, Richard E., 4,885,587, Cl. 42-14.000.

Marion Laboratories, Inc.: *See*—
Wynberg, Hans; and ten Hoeve, Wolter, 4,885,375, Cl. 549-557.000.

Marlen Research Corporation: *See*—
Powers, Richard G.; Currier, Joseph G.; and Zeets, Joseph S., 4,884,594, Cl. 137-625.480.

Marler, David O.: *See*—
Chu, Yung F.; Marler, David O.; and McWilliams, John P., 4,885,426, Cl. 585-474.000.

Marner, Wilbur J.: *See*—
Suitor, Jerry W.; Berdahl, C. Martin; and Marner, Wilbur J., 4,885,142, Cl. 423-219.000.

Marriott, Lee W., to Tecumseh Products Company. Speed governor for small engines. 4,884,541, Cl. 123-361.000.

Marsh, Edward K.: *See*—
Chandler, Curtis S.; and Marsh, Edward K., 4,884,981, Cl. 439-610.000.

Marshall, Connie T.: *See*—
Read, Randol R.; Warmack, Ralph E.; Farmer, James M.; Henshaw, Jerry D.; and Marshall, Connie T., 4,885,724, Cl. 367-77.000.

Martell, David R., to Babcock Industries Inc. Cable control with seal. 4,884,467, Cl. 74-501.50R.

Martin, Clifford A.: *See*—
Telfair, William B.; Martin, Clifford A.; Gordon, Eugene I.; and Fricke, William C., 4,885,471, Cl. 250-461.100.

Martin, Donald L., to M. K. Products. Brake for welding machine. 4,885,453, Cl. 219-136.000.

Martin, James A., to United States of America, National Aeronautics and Space Administration. Earth-to-orbit vehicle providing a reusable orbital stage. 4,884,770, Cl. 244-158.00R.

Martindale, David C., to UOP. Process for the production of aromatic hydrocarbons from olefinic hydrocarbons. 4,885,420, Cl. 585-322.000.

Martinez, David M.; and Campbell, Gordon C., to Robert Bosch Power Tool Corporation. Saber saw. 4,884,344, Cl. 30-394.000.

Marty, Jean P.: *See*—
Cormier, Michel J. N.; Ledger, Philip W.; Amkraut, Alfred; and Marty, Jean P., 4,885,154, Cl. 424-10.000.

Maruno, Makoto: *See*—
Gohbayashi, Masayoshi; Narita, Noritsugu; and Maruno, Makoto, 4,885,382, Cl. 560-75.000.

Marusak, Thomas J.: *See*—
Schnebly, John; and Marusak, Thomas J., 4,884,612, Cl. 160-84.100.

Maruta, Syuzi; and Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Automatic image duplicating apparatus. 4,885,609, Cl. 355-202.000.

Marx, Edmund N., Jr. Edge curling device for Fourdrinier fabric. 4,885,059, Cl. 162-274.000.

Marzotto, Gaetano, to Manifattura Lane Gaetano Marzotto & Figli S.P.A. Process for the manufacture of a blanket product. 4,884,325, Cl. 28-160.000.

Masaki, Yuuichi: *See*—
Uchiyama, Akira; Masaki, Yuuichi; Iwabuchi, Toshiyuki; Nomoto, Tsutomu; and Sakamoto, Masaaki, 4,885,622, Cl. 357-30.000.

Masanori, Sugiyama: *See*—
Aoki, Kohji; Yasuda, Tomio; Masanori, Sugiyama; and Osamu, Komazawa, 4,885,566, Cl. 340-457.100.

Maschinenfabrik Andritz Actiengesellschaft: *See*—
Sbaschnigg, Johann, 4,885,088, Cl. 210-400.000.

Maschinenfabrik Bezner GmbH & Co. KG: *See*—
Allgauer, Gunter; Strohhacker, Peter; and Fuchs, Dieter, 4,884,700, Cl. 209-685.000.

Masler, William F.: *See*—
Amjad, Zahid; and Masler, William F., 4,885,097, Cl. 210-701.000.

Mason, Charles P. Gondola attachment for helium-filled toy balloon. 4,884,987, Cl. 446-77.000.

Mason, Steven M.: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; White, Danny R.; and Johnson, William B., 4,885,130, Cl. 419-12.000.

Massachusetts Institute of Technology: *See*—
McAulay, Robert J.; and Quatieri, Thomas F., Jr., 4,885,790, Cl. 381-36.000.
Penman, Sheldon; and Fey, Edward G., 4,885,236, Cl. 435-6.000.
Wurtman, Richard J.; and Maher, Timothy J., 4,885,312, Cl. 514-561.000.

Massaro, Dominic W. Child's easy-to-read timepiece. 4,885,731, Cl. 368-228.000.

Master, Raj N.: *See*—
Anderson, Herbert R., Jr.; Divakaruni, Renuka S.; Dynys, Joseph M.; Kandetzke, Steven M.; Kirby, Daniel P.; Master, Raj N.; and Casey, Jon A., 4,885,038, Cl. 156-89.000.

Masuda, Michiyuki: *See*—
Ueha, Sadayuki; Kurosawa, Minoru; and Masuda, Michiyuki, 4,885,499, Cl. 310-328.000.

Masuda, Yoshinori, to Kabushiki Kaisha Murakoshi Seiko. Hinge. 4,884,316, Cl. 16-288.000.

Mathis, Christian, to Iveco Fiat S.p.A.; and Dereco Dieselmotoren Forschungs-und Entwick-lungs-AG. Fuel injection system for an internal combustion engine. 4,884,545, Cl. 123-447.000.

Matsuda, Hideki; and Takahashi, Hidenori, to Bridgestone Corporation. Pneumatic tires having improved wet performances. 4,884,606, Cl. 152-209.00R.

Matsuda, Junichi: *See*—
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Matsudaira, Tadahiro: *See*—
Asano, Kiro; Matsudaira, Tadahiro; Tamura, Humio; Suzuki, Toichi; and Wada, Hisayuki, 4,885,290, Cl. 514-182.000.

Matsumoto, Akio: *See*—
Ito, Haruyuki; and Matsumoto, Akio, 4,884,959, Cl. 425-84.000.

Matsumoto, Masatsugu, to Create System Co., Ltd. Crimp connector and method of attaching wire to it. 4,884,984, Cl. 439-877.000.

Matsumura, Yasuo: *See*—
Shimizu, Isoo; Matsumura, Yasuo; and Inomata, Yoshihisa, 4,885,419, Cl. 585-25.000.

Matsunaga, Takahiro: *See*—
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Matsuo, Katsuharu: *See*—
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Matsuo, Masaaki; Morino, Daizo; Tsuji, Kiyoshi; and Okumura, Hiroyuki, to Fujisawa Pharmaceutical Co., Ltd. Thiazolopyridine compounds, processes for the preparation thereof and pharmaceutical composition comprising the same. 4,885,297, Cl. 514-253.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ban, Yuzaburo; Manno, Masaya; Kubo, Minoru; Morisaki, Mototsugu; and Ogura, Mototsugu, 4,885,260, Cl. 437-81.000.
Fujii, Satoru; Niyada, Katsuyuki; Morii, Shuji; and Watanabe, Taisuke, 4,885,791, Cl. 381-43.000.
Fukushima, Yoshihisa; Satoh, Isao; Ichinose, Makoto; Kuroki, Yuzuru; and Takagi, Yuuji, 4,885,735, Cl. 369-59.000.
Hasegawa, Yo; Okano, Kazuyuki; Nakanishi, Akira; and Hatase, Hiroshi, 4,885,188, Cl. 427-126.100.
Nakakura, Hirofumi; Shibata, Morio; Ishikawa, Haruo; Nakano, Akihisa; Hiroto, Hiromi; and Oyabu, Hajime, 4,885,176, Cl. 426-19.000.
Nishino, Atsushi; Mizuno, Yasuo; and Ikeda, Masaki, 4,885,020, Cl. 65-2.000.
Yokotani, Yoichiro; Kagata, Hiroshi; Niwa, Hiroshi; Kato, Junichi; and Mihara, Toshihiro, 4,885,661, Cl. 361-321.000.
Matsushita, Yoshiaki, to Kabushiki Kaisha Toshiba. Gettering process with multi-step annealing and inert ion implantation. 4,885,257, Cl. 437-11.000.
Matsuura, Norio. Spring producing apparatus. 4,884,428, Cl. 72-142.000.
Matt, Peter, to VSL International AG. Removable tension member. 4,884,377, Cl. 52-98.000.
Matthews, John C.: *See*—
Ury, Michael G.; Matthews, John C.; and Rounds, Stuart N., 4,885,047, Cl. 156-345.000.
Matthews, Lloyd E., to Zenith Electronics Corporation. Beam current compensated vertical size control. 4,885,510, Cl. 315-411.000.
Mattila, Timo; and Elf, Juha, to Halton Oy. Object identifying device. 4,885,461, Cl. 250-223.00B.
Max, Co., Ltd.: *See*—
Yamaguchi, Morio, 4,884,906, Cl. 400-162.300.
Max, Robert C.: *See*—
Pham, Hoa; and Max, Robert C., 4,885,436, Cl. 200-50.00A.
May, Michael D.: *See*—
Parson, Brian J.; Shepherd, Roger M.; May, Michael D.; and Stewart, Graham, 4,885,740, Cl. 370-60.000.
May, Robin F., to Comalco Aluminum Limited. Aluminium alloys suitable for sacrificial anodes. 4,885,045, Cl. 148-440.000.
Maye, David; and Choung, Moon, to Cooper Industries, Inc. Plate lifting clamp. 4,884,836, Cl. 294-101.000.
Mayer, Kurt; Richey, Volker; and Schneider, Hans-Peter, to Fried Krupp, GmbH. Device for early detection of breaks and marginal wear in the cutting edges of tools. 4,885,530, Cl. 324-61.00R.
Mayle, Eugene E. Optical transmitting and receiving apparatus. 4,885,804, Cl. 455-606.000.
Mayr, Max: *See*—
Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.
Mays, Ralph C. Attachment for removably supporting a denture in the mouth of the user. 4,884,970, Cl. 433-172.000.
Maytag Corporation: *See*—
Mandel, Sheldon W.; and Banerjee, Chinmoy, 4,884,415, Cl. 62-277.000.
Mayumi, Junji; and Omori, Hiroshi, to Mitsubishi Petrochemical Co., Ltd. Thermoplastic resin composition. 4,885,334, Cl. 525-66.000.
Mazda Motor Corporation: *See*—
Harada, Yasuhiro; Nobumoto, Kazutoshi; Nishimura, Eizi; and Onaka, Toru, 4,884,651, Cl. 180-197.000.
Mazure-Espejo, C. A.; and Neppl, Franz, to Siemens Aktiengesellschaft. Metal-oxide semiconductor (MOS) field effect transistor having extremely shallow source/drain zones and silicide terminal zones, and a process for producing the transistor circuit. 4,885,617, Cl. 357-23.900.
Mazzone, Thomas J. Wrench with rack and segment gear linkage. 4,884,479, Cl. 81-128.000.
McAulay, Robert J.; and Quatieri, Thomas F., Jr., to Massachusetts Institute of Technology. Processing of acoustic waveforms. 4,885,790, Cl. 381-36.000.
McAuliffe, Kevin P.: *See*—
Anthony, John H.; Brantley, William C., Jr.; McAuliffe, Kevin P.; Norton, Vern A.; and Pfister, Gregory F., 4,885,680, Cl. 364-200.000.
McCabe, Lance C., to Bristol Fiberlite Industries, Inc. Skylight structure and method of manufacture therefor. 4,884,379, Cl. 52-200.000.
McCambridge, John M., to Chrysler Motors Corporation. Serial to parallel data conversion system. 4,885,583, Cl. 341-100.000.
McCanny, John V.; Evans, Richard A.; and McWhirter, John G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Digital processor for convolution and correlation. 4,885,715, Cl. 364-728.010.
McCarthy, Brian D.; and Regan, Bernard J., to MS Instruments public limited company. Position measuring apparatus and method. 4,885,725, Cl. 367-129.000.
McCarthy, Walton, to Theta Technologies, Inc. Underground storage tank. 4,884,709, Cl. 220-5.00A.
McClellan, Paul J.: *See*—
Eisenstein, Gabe L.; Grodd, Laurence W.; McClellan, Paul J.; Miller, Robert M.; Patton, Charles M.; and Wickes, William C., 4,885,714, Cl. 364-709.010.
McClish, Richard E. D. Electronic scratch filter for bowed instruments. 4,884,486, Cl. 84-736.000.
McClung, Duane G.: *See*—
Newhouse, Thomas J.; Goeman, Donald D.; and McClung, Duane G., 4,884,513, Cl. 108-50.000.
McCormick, Peter E.; Culbertson, Timothy D.; and Autry, Walter D., Jr., to EOA Systems, Inc. Variable compliance device. 4,884,670, Cl. 192-56.00F.
McCoy, Michael J.; Hartman, John E.; and Wesbster, John L., to Minnesota Mining and Manufacturing Company. Surface mount compatible connector system with solder strip and mounting connector to PCB. 4,884,335, Cl. 29-839.000.
McCulloch, Archibald W.: *See*—
De Freitas, Anthony S. W.; McCulloch, Archibald W.; and McInnes, Alister G., 4,885,149, Cl. 423-339.000.
McDonald, John H., III, to Eli Lilly and Company. 1-carba(dethia)-3-cephem derivatives. 4,885,291, Cl. 514-210.000.
McGean-Rohco, Inc.: *See*—
Bokisa, George S.; and Page, Billie J., 4,885,064, Cl. 204-44.400.
McGoldrick, Dennis E., Trustee: *See*—
Finkel, A. Milton; and Bunka, Stephan F., 4,884,420, Cl. 70-58.000.
McGregor, Harold R. Rotating carousel and bag handling apparatus for paper or plastic bags. 4,884,389, Cl. 53-571.000.
McGuigan, Henry C.: *See*—
Hillig, William B.; and McGuigan, Henry C., 4,885,265, Cl. 501-95.000.
McGuire, Dennis P.: *See*—
Baheti, Ram J.; McGuire, Dennis P.; and Kosar, Kaya A., 4,884,656, Cl. 181-207.000.
McInnes, Alister G.: *See*—
De Freitas, Anthony S. W.; McCulloch, Archibald W.; and McInnes, Alister G., 4,885,149, Cl. 423-339.000.
McIntosh, R. Bruce; and Thern, Royal G., to Thorn, Inc. Hoist with oil cooled brake. 4,884,783, Cl. 254-343.000.
McKay, Alexander S.; Livesey, Declan B.; and Harris, Philip, to Texaco Canada Resources. Enhanced oil recovery with a mixture of water and aromatic hydrocarbons. 4,884,635, Cl. 166-271.000.
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Farrow, John F.; and Schulz, David W., 4,885,451, Cl. 219-110.000.
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Kershaw, Peter; Meixner, Beo; and Olmstead, Gordon, 4,884,844, Cl. 297-362.000.
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Knothe, Erich; and Melcher, Franz-Josef, 4,884,645, Cl. 177-180.000.
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Vyas, Kamlesh P.; and Kari, Hanumath P., 4,885,314, Cl. 514-630.000.
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Miat S.p.A.: *See—*
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Lavoie, Gerard H.; Miller, Charles W., Jr.; Currier, John K.; Saunders, Lionel F.; and Leary, Daniel J., 4,885,454, Cl. 219-390.000.
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Maher, Joseph A.; Vowles, E. John; Napoli, Joseph D.; Zafiropoulo, Arthur W.; and Miller, Mark W., 4,885,050, Cl. 156-345.000.
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Bernardin, Rodney A.; Hanken, Laurel A.; Insley, Thomas I.; and Murray, Alice C., 4,884,684, Cl. 206-204.000.
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Higashio, Kimihiko; and Nishimori, Kadotaro, 4,885,611, Cl. 355-245.000.
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Eguchi, Tatsuya, 4,885,594, Cl. 346-108.000.
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Mintzer, Frederick C.: *See—*
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Mr. Christmas Incorporated: *See—*
Hermanson, Terry, 4,885,664, Cl. 362-123.000.
Misumi, Teruyuki: *See—*
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Mita Industrial Co., Ltd.: *See—*
Uryu, Toshiyuki; and Nishiguchi, Toshihiko, 4,885,369, Cl. 548-183.000.
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Mitschker, Alfred: *See—*
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Mitsuba Electric Mfg. Co. Ltd.: *See—*
Kurihara, Norimitsu; and Asakura, Masahiko, 4,885,692, Cl. 364-426.040.
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Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujimoto, Akihiko, 4,885,695, Cl. 364-474.230.
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Higashi, Kazuhiko, 4,885,494, Cl. 310-211.000.
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Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
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Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
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Mitsubishi Petrochemical Co., Ltd.: *See*—
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Mitsubishi Rayon Co., Ltd.: *See*—
Miyamori, Takao; Numazawa, Ryozo; Sakimae, Akihiro; and Onishi, Hisao, 4,885,244, Cl. 435-101.000.

Mitsui Ocean Development & Engineering Co., Ltd.: *See*—
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Mitsui Petrochemical Industries, Ltd.: *See*—
Tominaga, Kaoru; Kan, Kojiro; Takata, Toshimasa; and Tomoshige, Toru, 4,885,329, Cl. 524-430.000.

Mitsui, Takeshi: *See*—
Mimuro, Tetsushi; Abe, Hiroki; Honda, Masahiro; and Mitsui, Takeshi, 4,884,647, Cl. 180-140.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
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Mitsuno, Yuichiro: *See*—
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Mitsuya, Yoshihide: *See*—
Kageyama, Hidehei; Mitsuya, Yoshihide; and Nakazato, Yoichi, 4,884,910, Cl. 401-65.000.

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Miwa, Hirohide, to Tokyo Koshumosu Denki Kabushiki Kaisha. Automatic answering telephone system using main and auxiliary recording mediums. 4,885,764, Cl. 379-70.000.

Miwa, Kiyoshi: *See*—
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Miyagawa, Michiaki; Oki, Koichi; and Horii, Hiroyuki, to Fuji Electric Company Ltd. System for binary encoding a picture. 4,885,784, Cl. 382-8.000.

Miyake, Joji: *See*—
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Miyake, Miyuki; Toda, Haruhiko; and Yasu, Minako, to Lion Corporation. Hiar cosmetic composition. 4,885,159, Cl. 424-70.000.

Miyamori, Takao; Numazawa, Ryozo; Sakimae, Akihiro; and Onishi, Hisao, to Mitsubishi Rayon Co., Ltd. Method of producing hyaluronic acid. 4,885,244, Cl. 435-101.000.

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Miyamoto, Tomohiko; Koyama, Shuntaro; Tomuro, Jinichi; Morihara, Atsushi; Yamashita, Hisao; Takahashi, Sadao; Kida, Eiji; Ueda, Akio; and Takamoto, Shigehito, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Desulfurizing agent and process for treating hydrogen sulfide containing gas, coal gasification system and power generation system based on coal gasification using the desulfurizing agent. 4,884,396, Cl. 60-39.120.

Miyamura, Yoshimori. Knitting sticks made of bamboo. 4,884,619, Cl. 163-5.000.

Miyazaki, Masaaki: *See*—
Ishii, Mitsuaki; Miyazaki, Masaaki; and Matsunaga, Takahiro, 4,885,691, Cl. 364-424.040.

Miyazaki, Masahiro: *See*—
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Miyazawa, Osamu, to Seiko Epson Corporation. Analog electronic timepiece using an intermittent driving signal. 4,885,730, Cl. 368-157.000.

Miyoshi, Makoto: *See*—
Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, 4,884,648, Cl. 180-142.000.

Mizoguchi, Yoshiyuki: *See*—
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Mizokami, Hiroshi: *See*—
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Mizuno, Tetsuya: *See*—
Sonoi, Takehiro; Sagawa, Toshimasa; Yamada, Okimasa; and Mizuno, Tetsuya, 4,885,398, Cl. 568-404.000.

Mizuno, Yasuo: *See*—
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Mobay Corporation: *See*—
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Mobelteam AB: *See*—
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Mobil Oil Corporation: *See*—
Chu, Yung F.; Marler, David O.; and McWilliams, John P., 4,885,426, Cl. 585-474.000.
Degnan, Thomas F., Jr.; and Dessau, Ralph M., 4,884,531, Cl. 123-3.000.
Herrington, Fox J., 4,885,196, Cl. 428-36.500.
Jones, Timothy A.; Kaluza, Thomas J.; and Roach, Robert E., 4,884,438, Cl. 73-153.000.
Leland, Frank, 4,885,722, Cl. 367-25.000.
Nowlin, Thomas E., 4,885,349, Cl. 526-122.000.
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Modelkin, Jury I.: *See*—
Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

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Moisson, Marc F.: *See*—
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Mole-Richardson Company: *See*—
Krokaugger, William G., 4,885,508, Cl. 315-287.000.

Molecular Design International: *See*—
Parish, Harlie A.; and Purcell, William P., 4,885,311, Cl. 514-549.000.

Monceaux, Wilbur: *See*—
Srinivasan, Vadake R.; and Monceaux, Wilbur, 4,885,094, Cl. 210-610.000.

Monsanto Company: *See*—
Lee, Len F.; and Dolson, Mark G., 4,885,026, Cl. 71-94.000.

Montedison S.p.A.: *See*—
Gardano, Andrea; Casagrande, Francesco; Foa, Marco; Petrini, Guido; Barisone, Riccardo; and Chapoy, Lawrence, 4,885,409, Cl. 568-834.000.

Moore, Eugene R.: *See*—
Traugott, Thomas D.; Moore, Eugene R.; and Malanga, Michael T., 4,885,339, Cl. 525-132.000.

Moore, James E.; Kale, B. Michael; Csanak, George; and Luty, Fritz, to Barnes Engineering Company. Narrow-band optical absorption filter. 4,884,855, Cl. 350-1.100.

Moore, Jesse C., to J. C. Moore Research, Inc. Fuel and air induction structure and mechanism for internal combustion engines. 4,884,534, Cl. 123-52.0MV.

Moore, Joe T. Pier cushioning system. 4,884,919, Cl. 405-212.000.

Moradi-Araghi, Ahmad: *See*—
Mumallah, Naim A.; and Moradi-Araghi, Ahmad, 4,884,636, Cl. 166-295.000.

Morenus, Richard J.: *See*—
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Morgan Construction Company: *See*—
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Read, Edgar L.; Grant, Elwyn E.; Keto, Gary A.; Lin, Sharlene C.; Morgan, James D.; Nimon, Robert E.; Oldham, Oliver G.; Adams, Allen R., Jr.; and Salmones, Jose A., 4,885,739, Cl. 370-58.100.

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Mori, Kenji; and Tsuji, Masahiro, to Nisshin Flour Milling Co., Ltd. Optically active carbacyclin intermediates and processes for the preparation thereof. 4,885,246, Cl. 435-123.000.

Mori, Mikio. Overcasting attachment for use with a sewing machine. 4,884,518, Cl. 112-162.000.

Mori, Shigeru: *See*—
Fukuda, Kyohei; Sakurai, Soichi; Hirata, Koji; and Mori, Shigeru, 4,884,879, Cl. 350-432.000.

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Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,884,580, Cl. 128-804.000.

Mori, Tamotsu: *See—*
Hosoda, Naoyuki; Tanaka, Masayuki; and Mori, Tamotsu, 4,885,135, Cl. 420-507.000.

Morihara, Atsushi: *See—*
Miyamoto, Tomohiko; Koyama, Shuntaro; Tomuro, Jinichi; Morihara, Atsushi; Yamashita, Hisao; Takahashi, Sadao; Kida, Eiji; Ueda, Akio; and Takamoto, Shigehito, 4,884,396, Cl. 60-39.120.

Morii, Shuji: *See—*
Fujii, Satoru; Niyada, Katsuyuki; Morii, Shuji; and Watanabe, Taisuke, 4,885,791, Cl. 381-43.000.

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Morino, Daizo: *See—*
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Morisaki, Mototsugu: *See—*
Ban, Yuzaburo; Manno, Masaya; Kubo, Minoru; Morisaki, Mototsugu; and Ogura, Mototsugu, 4,885,260, Cl. 437-81.000.

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Morita, Kouichi: *See—*
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Morris, James K. Exhaust system for rear-engine vehicles. 4,884,399, Cl. 60-313.000.

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Thrift, Robert L.; and Morris, Paul K., 4,885,549, Cl. 324-307.000.

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Gray, Randall C., 4,885,484, Cl. 307-495.000.
Hall, James B.; and Sheff, Sumner, 4,885,056, Cl. 156-662.000.
Hietala, Alexander W.; and Gillig, Steven F., 4,885,553, Cl. 331-17.000.
Mahabadi, John K., 4,885,476, Cl. 307-272.300.
Nelson, Leonard E., 4,885,577, Cl. 340-825.440.
Van Horn, Mark I., 4,885,799, Cl. 455-78.000.

Mount, Houston B., II: *See—*
Snoddy, Michael L.; and Mount, Houston B., II, 4,885,540, Cl. 324-318.000.

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McCarthy, Brian D.; and Regan, Bernard J., 4,885,725, Cl. 367-129.000.

MTS Systems Corporation: *See—*
Meline, Harry R.; and Iverslie, Scott P., 4,884,456, Cl. 73-826.000.

MTU Motoren-und Turbinen Union Munchen GmbH: *See—*
Sikorski, Siegfried, 4,884,948, Cl. 416-132.00R.

Mueller, Walter B.; and Schirmer, Henry G., to W. R. Grace & Co. Method of making a multilayer film. 4,885,119, Cl. 264-22.000.

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Mullendore, James A.: *See—*
Spencer, James R.; and Mullendore, James A., 4,885,031, Cl. 75-248.000.

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Pate, Gerry E.; Mullinax, Ronald L.; Sutton, Alexander G.; and Ross, Jeff E., 4,885,706, Cl. 364-551.010.

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Mungons, Edwin M. Auxiliary cane or crutch device for helping to lift legs or feet or foot. 4,884,587, Cl. 135-65.000.

Munn, Roger E.: *See—*
Burnham, Audrey R.; Ewards, Christopher J.; and Munn, Roger E., 4,884,828, Cl. 283-89.000.

Murakami, Chikara: *See—*
Hiyama, Hirokuni; Watanabe, Katsuhide; Nakajima, Atsushi; and Murakami, Chikara, 4,885,491, Cl. 310-90.500.

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Murakami, Masatoshi: *See—*
Ozawa, Akira; Kousaka, Tomomi; Suzuki, Hideo; and Murakami, Masatoshi, 4,884,332, Cl. 29-568.000.

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Muraro, Pierre; and Pernot, Daniel, to Garnier Ponsonnet - Vuillard S.A. Linking process and linking device between a fabrication machine for envelopes and a conditioning machine. 4,884,675, Cl. 198-358.000.

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Fukushima, Takeo; Mizuguchi, Masami; Furukawa, Takahiro; Yato, Yoshiaki; Sato, Kenji; Fujimoto, Naonobu; and Murase, Tetsuro, 4,885,746, Cl. 370-102.000.

Murata Manufacturing Company: *See—*
Ikeuchi, Hiroshi, 4,885,509, Cl. 315-411.000.

Murphy, Robert A.: *See—*
Arenal, Mark G.; and Murphy, Robert A., 4,884,878, Cl. 350-429.000.

Murray, Alice C.: *See—*
Bernardin, Rodney A.; Hanken, Laurel A.; Insley, Thomas I.; and Murray, Alice C., 4,884,684, Cl. 206-204.000.

Murray, Michael J.: *See—*
Hughan, Robert R.; Hannink, Richard H. J.; Swain, Michael V.; Stringer, Robert K.; Murray, Michael J.; and Garvie, Ronald C., 4,885,266, Cl. 501-104.000.

Mushinski, Roger J.; Lewis, Charles E.; and Casey, Lawrence J., to Appleton Papers Inc. Interleaved spiral wrapping of foam product and stretch film for packaging carbonless paper rolls. 4,884,385, Cl. 53-399.000.

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Yamashita, Hiroshi; and Muto, Kenkichi, 4,885,350, Cl. 526-201.000.

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Citta, Richard W.; Long, Michael E.; and Mutzabaugh, Dennis M., 4,885,776, Cl. 380-15.000.

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Myers, Terry N., to Pennwalt Corporation. Polymer containing hindered amine light stabilizing groups and process of making the same. 4,885,347, Cl. 525-447.000.

Myers, Wilbur J., to Conoco Inc. Compound hydraulic seismic source vibrator. 4,885,726, Cl. 367-142.000.

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Benjak, Leo; and Myler, Ronald J., 4,884,390, Cl. 54-7.000.

Nachtigall, Ronnie; and Fisher, Frank N. Belt binder for cargo binder chains. 4,884,928, Cl. 410-103.000.

Nadasky, Thomas M.: *See—*
Bensing, Gregory L.; Nadasky, Thomas M.; and Wright, Raymond C., 4,884,980, Cl. 439-606.000.

Nadherny, Rudolph E.: *See—*
Jensen, Finn; and Nadherny, Rudolph E., 4,885,061, Cl. 188-206.00R.

Nagai, Yasuo; Shimizu, Isao; Kimura, Masatoshi; Kaneko, Kenji; Okabe, Takeaki; and Sakamoto, Koozoo, to Hitachi, Ltd. Semiconductor integrated circuit device. 4,885,628, Cl. 357-68.000.

Nagami, Tetsuo: *See—*
Miyamoto, Noritaka; Koujiya, Miyuki; Miyake, Joji; Iomoda, Takashi; Ohsawa, Hidetoshi; and Nagami, Tetsuo, 4,885,213, Cl. 428-612.000.

Nagamoto, Itsushi: *See—*
Nagasaki, Yoichi; Nagamoto, Itsushi; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,884,812, Cl. 273-167.00H.

Nagano, Eiki: *See—*
Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, 4,885,024, Cl. 71-92.000.

Nagasaki, Yoichi; Nagamoto, Itsushi; Tadokoro, Toyohiko; and Fujimura, Masaki, to Yamaha Corporation. Golf club head. 4,884,812, Cl. 273-167.00H.

Nagasawa, Moriya: *See—*
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Nagase, Toshio, to Nippon Zeon Co., Ltd. Process for manufacturing spherical objects. 4,885,118, Cl. 264-13.000.

Nagatsuka, Yoshitaka; Saito, Masaki; and Kawabe, Yoshitaka, to JEOL, Ltd. Spectrum display device for x-ray microanalyzer or the like. 4,885,465, Cl. 250-310.000.

Nagatsuma, Nobuyoshi; and Kamata, Yoshiharu, to Honda Giken Kogyo Kabushiki Kaisha. Boot assembling apparatus for drive shaft. 4,884,327, Cl. 29-235.000.

Naik, Subhash K., to AVCO Corporation. High strength nickel base single crystal alloys. 4,885,216, Cl. 428-680.000.

Naitou, Yasuo: *See—*
Onishi, Masayoshi; Naitou, Yasuo; and Yasukawa, Takeshi, 4,884,649, Cl. 180-179.000.

Nakada, Akihiko: *See*—
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Nakahara, Yutaka: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Tobita, Etsuo, 4,885,323, Cl. 524-95.000.

Nakahashi, Junichi: *See*—
Hamada, Tetsuo; Nakahashi, Junichi; and Nakai, Ryoichi, 4,885,340, Cl. 525-183.000.

Nakai, Ryoichi: *See*—
Hamada, Tetsuo; Nakahashi, Junichi; and Nakai, Ryoichi, 4,885,340, Cl. 525-183.000.

Nakajima, Atsushi: *See*—
Hiyama, Hirokuni; Watanabe, Katsuhide; Nakajima, Atsushi; and Murakami, Chikara, 4,885,491, Cl. 310-90.500.

Nakakura, Hirofumi; Shibata, Morio; Ishikawa, Haruo; Nakano, Akihisa; Hiroto, Hiromi; and Oyabu, Hajime, to Matsushita Electric Industrial Co., Ltd. Method of making bread. 4,885,176, Cl. 426-19.000.

Nakamori, Shigeru: *See*—
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Nakamura, Kiyoshi: *See*—
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Nakamura, Takeaki: *See*—
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Nakamura, Taku, to Fuji Photo Film Co., Ltd. Image-receiving material and image-forming method employing the same. 4,885,227, Cl. 430-254.000.

Nakamura, Yasuharu: *See*—
Kitazume, Kiyoshi; Nakamura, Yasuharu; Ochiai, Hiromichi; and Nozaki, Hisashi, 4,885,185, Cl. 426-598.000.

Nakanishi, Akira: *See*—
Hasegawa, Yo; Okano, Kazuyuki; Nakanishi, Akira; and Hatase, Hiroshi, 4,885,188, Cl. 427-126.100.

Nakano, Akihisa: *See*—
Nakakura, Hirofumi; Shibata, Morio; Ishikawa, Haruo; Nakano, Akihisa; Hiroto, Hiromi; and Oyabu, Hajime, 4,885,176, Cl. 426-19.000.

Nakano, Shoichi: *See*—
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Nakano, Yoshihito, to Kitagawa Industries Co., Ltd. Electric noise absorber. 4,885,559, Cl. 336-92.000.

Nakasuna, Seiko: *See*—
Ichimura, Shigeru; Nakasuna, Seiko; Kawarai, Takeshi; Nishiyama, Takanori; and Toyoshima, Shuji, 4,885,643, Cl. 358-335.000.

Nakata, Tetsuro; Sato, Ichitaro; and Eto, Tooru, to Sony Corporation. Apparatus for eliminating a noise signal. 4,885,639, Cl. 358-167.000.

Nakatsuka, Iwao; Okuno, Masami; Shiba, Kunio; and Yoshitake, Akira, to Sumitomo Chemical Company, Limited. Radioactive benzodiazepine derivatives. 4,885,152, Cl. 424-1.100.

Nakazato, Yoichi: *See*—
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Nakazawa, Hirotsugu: *See*—
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Nakazawa, Masahiro, to Kabushiki Kaisha P C Planning. Handle fitting structure for packaging box. 4,884,837, Cl. 294-158.000.

Nalco Chemical Company: *See*—
Fong, Dodd W., 4,885,345, Cl. 525-329.400.

Nanometrics Incorporated: *See*—
Coates, Vincent J., 4,884,890, Cl. 356-384.000.

Napoli, Joseph D.: *See*—
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Narayan, Jagdish: *See*—
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Nardone, Vincent C.: *See*—
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Narita, Noritsugu: *See*—
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National Research Development Corporation: *See*—
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Nawamaki, Tsutomu: *See*—
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 4,885,022, Cl. 71-86.000.

Nawroth, Peter P.; Stern, David M.; and Wilner, George D., to Oklahoma Medical Research Foundation. Anticoagulant therapy. 4,885,277, Cl. 514-15.000.

Naylor, Frank R.: *See*—
Leather, Terence H.; Naylor, Frank R.; and Gradwell, Paul S., 4,885,797, Cl. 455-40.000.

Nazar, Lawrence R.: *See*—
Hwang, Dah-min D.; and Nazar, Lawrence R., 4,885,051, Cl. 156-345.000.

Neale, Michael J.; and Polak, Thomas A., to Collins Motor Corporation Limited. Interconnecting rotary and reciprocatory motion. 4,884,536, Cl. 123-197.0AC.

Neat, Rosamund C.: *See*—
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NEC Corporation: *See*—
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Komoto, Yasuhiko, 4,885,682, Cl. 364-200.000.
Okazawa, Takeshi, 4,885,624, Cl. 357-42.000.
Okumura, Fujio, 4,884,875, Cl. 350-342.000.
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Neff, Dennis B. Data processing. 4,885,711, Cl. 364-574.000.

Negishi, Hidetaka; and Aoki, Shigemitsu, to Texas Instruments Incorporated. Display and keyboard panel. 4,885,574, Cl. 340-711.000.

Neighbors, Charles M. Process for making decorative item from aluminum cans. 4,884,328, Cl. 29-401.100.

Neihoff, Randall L.; and Drewry, Hugh R., Jr. Fishing bobber with signal light. 4,884,355, Cl. 43-17.000.

Nelle, Friedrich; Lehner, Heinz; and Nitzsche, Klaus, to Nokia Graetz. Winding apparatus. 4,884,759, Cl. 242-7.140.

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Nelson, Michael G.: *See*—
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Nelson Research & Development Co.: *See*—
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Nelson, Richard C.: *See*—
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Nenov, Sasho G.: *See*—
Beyazov, Yordan Y.; Nenov, Sasho G.; and Peychev, Vlayko S., 4,884,459, Cl. 73-861.520.

Neorx Corporation: *See*—
Wilbur, Daniel S.; Fritzberg, Alan R.; and Jones, David S., 4,885,153, Cl. 424-1.100.

Neppl, Franz: *See*—
Mazure-Espejo, C. A.; and Neppl, Franz, 4,885,617, Cl. 357-23.900.

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O'Brien, Dennis J.; Hanson, Paul G.; Klarquist, Thomas D.; Nepple, Bruce C.; Park, Michael C.; and Rosas, Robin R., 4,885,763, Cl. 379-67.000.

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Neumann, Frank: *See*—
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Strandholm, John J.; Prochnow, Robert R.; Miller, Mark S.; Woodford, Lawrence E.; and Neunaber, Steven M., 4,885,183, Cl. 426-582.000.

Newhouse, Thomas J.; Goeman, Donald D.; and McClung, Duane G., to Herman Miller, Inc. Work environment system. 4,884,513, Cl. 108-50.000.

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Newland, Paul W.: *See—*
Kelm, Walter H.; and Newland, Paul W., 4,884,483, Cl. 82-160.000.
Newman, Paul K. Chain saw attachment for lawn trimmer. 4,884,340, Cl. 30-122.000.
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Graef, Harry T.; and Newton, Kevin H., 4,884,679, Cl. 198-718.000.
NGK Spark Plug Co., Inc.: *See—*
Ueha, Sadayuki; Kurosawa, Minoru; and Masuda, Michiyuki, 4,885,499, Cl. 310-328.000.
NGK Spark Plug Co., Ltd.: *See—*
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NI Industries, Inc.: *See—*
Hempelmann, Heinrich J.; and Pruss, Eugene M., 4,884,851, Cl. 301-37.0PB.
Nichol, Robert E.; Grant, Robert B.; and Faddis, Charles T., to DLI Corporation. Vibration data collecting and processing apparatus and method. 4,885,707, Cl. 364-551.010.
Nicowski, Anthony T.: *See—*
Rabideau, Brian; Laughlin, William D.; Kissman, Kenneth; and Nicowski, Anthony T., 4,885,771, Cl. 379-354.000.
Nielsen, Edward G., to Laser Alignment, Inc. Self-contained laser-activated depth sensor for excavator. 4,884,939, Cl. 414-698.000.
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Osada, Hiroshi, 4,884,657, Cl. 181-258.000.
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Nilssen, Ole K. Electronic magnetron power supply. 4,885,506, Cl. 315-102.000.
Nimon, Robert E.: *See—*
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Imanaka, Asaji; Fujiwara, Tatsuo; and Osaka, Shuichi, 4,885,693, Cl. 364-426.020.
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Yokoyama, Yutaka; and Shinozaki, Fumihiko, 4,885,115, Cl. 252-62.200.
Nippon CMK Corp.: *See—*
Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katutomo; and Mukai, Norito, 4,885,431, Cl. 174-68.500.
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Yamamoto, Taizo; and Konishi, Hirokazu, 4,884,602, Cl. 141-242.000.
Nippon Mektron Limited: *See—*
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Nippon Oil and Fats Company, Limited: *See—*
Ishizaki, Takaharu; Igarashi, Taizo; Urano, Yasuo; and Onodera, Yumiko, 4,885,008, Cl. 44-62.000.
Nippon Paint Co., Ltd.: *See—*
Okai, Toshihiro; Okumura, Yoshiaki; Oda, Mitsuyuki; Yamamoto, Takashi; and Kuwajima, Teruaki, 4,885,032, Cl. 75-251.000.
Nippon Petrochemicals Company, Ltd.: *See—*
Shimizu, Isoo; Matsumura, Yasuo; and Inomata, Yoshihisa, 4,885,419, Cl. 585-25.000.
Nippon Seimitsu Kogyo Kabushiki Kaisha: *See—*
Shibata, Isao, 4,885,598, Cl. 354-106.000.
Nippon Telegraph and Telephone Corporation: *See—*
Takahara, Hideyuki; and Kiuchi, Kazuo, 4,885,267, Cl. 501-134.000.
Wakimoto, Tsutomu; and Akazawa, Yukio, 4,885,548, Cl. 330-260.000.
Nippon Zeon Co., Ltd.: *See—*
Aonuma, Mitsuyoshi; and Sugi, Nagatoshi, 4,885,341, Cl. 525-187.000.
Nagase, Toshio, 4,885,118, Cl. 264-13.000.
Nishiguchi, Toshihiko: *See—*
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Nishihara, Hiroshi: *See—*
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Nishikawa, Kazunori: *See—*
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Nishimori, Kadotaro: *See—*
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Nishimoto, Shigeto; Fujimoto, Yoshiki; Inoue, Noriaki; and Harada, Shunji, to Koyo Seiko Co., Ltd; and Kawasaki Steel Corporation. Apparatus for detecting a failure in bearings. 4,884,449, Cl. 73-660.000.
Nishimura, Eizi: *See—*
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Nishino, Atsushi; Mizuno, Yasuo; and Ikeda, Masaki, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing glass fiber. 4,885,020, Cl. 65-2.000.
Nishiyama, Hisashi: *See—*
Ogawa, Toshio; Nishiyama, Hisashi; Katakura, Kageyoshi; and Ishikawa, Shizuo, 4,884,448, Cl. 73-597.000.
Nishiyama, Takanori: *See—*
Ichimura, Shigeru; Nakasuna, Seiko; Kawarai, Takeshi; Nishiyama, Takanori; and Toyoshima, Shuji, 4,885,643, Cl. 358-335.000.
Nisikori, Toshiaka: *See—*
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Niskanen, Toivo, to A. Ahlstrom Corporation. Method and apparatus for pumping high-consistency fiber suspension. 4,884,943, Cl. 415-143.000.
Nissan Chemical Industries Ltd.: *See—*
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 4,885,022, Cl. 71-86.000.
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Nissan Shatai Company, Limited: *See—*
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Mori, Kenji; and Tsuji, Masahiro, 4,885,246, Cl. 435-123.000.
Nitoh, Toshikatsu; and Tokushige, Kazutomo, to Polyplastics Co., Ltd. Polyarylene sulfide resin composition and molded article for light reflection. 4,885,321, Cl. 523-219.000.
Nitta, Tomio, to Tokai Corporation. File assembly for use in a gas lighter. 4,884,964, Cl. 431-277.000.
Nitta, Tomio, to Tokai Corporation. Gaslighter structure permitting push-fit assembling of its main parts. 4,884,965, Cl. 431-277.000.
Nitzsche, Klaus: *See—*
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Niwa, Hiroshi: *See—*
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Nix, Frank H., Jr., to Delta Medical Systems, Inc. Protective face shield. 4,884,296, Cl. 2-011.000.
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Nix, Herman J.; and Nix, Roger D., 4,884,784, Cl. 254-362.000.
Niyada, Katsuyuki: *See—*
Fujii, Satoru; Niyada, Katsuyuki; Morii, Shuji; and Watanabe, Taisuke, 4,885,791, Cl. 381-43.000.
Nobile, John R., to Pitney Bowes Inc. Mailing machine including improved sheet feeding means. 4,884,503, Cl. 101-233.000.
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Harada, Yasuhiro; Nobumoto, Kazutoshi; Nishimura, Eizi; and Onaka, Toru, 4,884,651, Cl. 180-197.000.
Nodfelt, Ingvar, to AB Stratos. Method of optical connection of an end portion of an optical fibre with an other optical element. 4,884,861, Cl. 350-96.180.
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Nomoto, Tsutomu: *See—*
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Norfolk Scientific Inc.: *See—*
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Norsworthy, Jase O. Device and system for encoding a substrate with an ink. 4,885,459, Cl. 235-495.000.

North American Philips Corporation: *See*—
Dapo, Roland F., 4,885,660, Cl. 361-506.000.

Northeast University of Technology: *See*—
Guangchun, Yao; Zhuxian, Qiu; and Wu, Nu Z., 4,885,073, Cl. 204-291.000.

Northern Engineering and Plastics Corp.: *See*—
Crisci, Harry E., 4,884,707, Cl. 215-256.000.

Northern Telecom Limited: *See*—
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Northgate Research, Inc.: *See*—
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Northrop Corporation: *See*—
Thein, Joe K.; and Uldrich, Flerida B., 4,885,317, Cl. 521-149.000.

Norton Company: *See*—
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Norton, Vern A.: *See*—
Anthony, John H.; Brantley, William C., Jr.; McAuliffe, Kevin P.; Norton, Vern A.; and Pfister, Gregory F., 4,885,680, Cl. 364-200.000.

Norwich Eaton Pharmaceuticals, Inc.: *See*—
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Noto, Hiroshi; Hayashida, Nobuyuki; Kojima, Taketoshi; Ito, Makoto; and Kambayashi, Osamu, to Kyocera Corporation. Multi-function key input device. 4,885,580, Cl. 341-23.000.

Nottingham, John R.: *See*—
Kahl, John J., Jr.; Vulpitta, Brian A.; Corbo, Thomas A.; Saunders, Craig M.; and Nottingham, John R., 4,884,734, Cl. 225-26.000.

Novacek, Peter: *See*—
Meylan, Pierre; and Novacek, Peter, 4,884,951, Cl. 416-191.000.

Novis, Ari M.; Adams, Don L.; LaMontagne, Troy J.; and Sivahop, Albert, to United Technologies Corporation. Arrangement for controlling the position of an aircraft control surface. 4,885,514, Cl. 318-580.000.

Nowacki, Christopher; and Brisson. Alfred G., to Northgate Research, Inc. Device for sensing air flow. 4,884,460, Cl. 73-861.520.

Nowell, Gilbert S.; and Tenzer, Frederick D., to Pandel, Inc. Static dissipative mat. 4,885,659, Cl. 361-212.000.

Nowlin, Thomas E., to Mobil Oil Corporation. Process for polymerizing alpha-olefin polymers of relatively narrow molecular weight distribution and high melt index. 4,885,349, Cl. 526-122.000.

Nozaka, Kenkichi; Kawahara, Yosihiro; and Fukutaka, Takashi, to Kubota, Ltd. Device for connecting working implement to tractor. 4,884,639, Cl. 172-47.000.

Nozaki, Hisashi: *See*—
Kitazume, Kiyoshi; Nakamura, Yasuharu; Ochiai, Hiromichi; and Nozaki, Hisashi, 4,885,185, Cl. 426-598.000.

Nozaki, Masahiro; and Hikosaka, Atusi, to Toyoda Gosei Co., Ltd. Weather strip for use in automobile. 4,884,370, Cl. 49-479.000.

Numazawa, Ryozo: *See*—
Miyamori, Takao; Numazawa, Ryozo; Sakimae, Akihiro; and Onishi, Hisao, 4,885,244, Cl. 435-101.000.

Nunally, Charles M.: *See*—
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NUOVOPIGNONE-Industrie Meccaniche e Fonderia, S.p.A.: *See*—
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Nuttal, David A.: *See*—
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Nygren, Edward: *See*—
Ford, Kenneth R.; Ford, Ellen L.; Nygren, Edward; and Nygren, Joyce, 4,884,816, Cl. 273-240.000.

Nygren, Joyce: *See*—
Ford, Kenneth R.; Ford, Ellen L.; Nygren, Edward; and Nygren, Joyce, 4,884,816, Cl. 273-240.000.

Nymark, Ellen: *See*—
Nymark, Hans; and Nymark, Ellen, 4,884,701, Cl. 211-69.800.

Nymark, Hans; and Nymark, Ellen. Artists' implement organizer. 4,884,701, Cl. 211-69.800.

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Beierle, John D., 4,885,769, Cl. 379-210.000.
Brancati, Rudolph P., 4,885,774, Cl. 379-438.000.

Oberhausen, Erich; Kuhlmann, Ludwig; Seibert, Gerhard; Steinstrasser, Axel; Schroth, Hans-Joachim; and Bremer, Karl-Heinz, to Hoechst Aktiengesellschaft. Diagnostic aid for the scintigraphic visualization of malignant tumors comprising the substance obtained from enzymatic processing of murein using hen's eggwhite lysozyme. 4,885,151, Cl. 424-1.100.

Oberle, Hans-Dieter: *See*—
Hoffmann, Kurt; Oberle, Hans-Dieter; Kraus, Rainer; Kowarik, Oskar; and Paul, Manfred, 4,885,748, Cl. 371-21.300.

O'Brien, Dennis J.; Hanson, Paul G.; Klarquist, Thomas D.; Nepple, Bruce C.; Park, Michael C.; and Rosas, Robin R., to AT&E Corporation. Voice mail system with improved detection and cancellation. 4,885,763, Cl. 379-67.000.

Occidental Chemical Corporation: *See*—
Kubiak, Kenneth F., 4,885,417, Cl. 570-211.000.

Ocheda, Daniel D.: *See*—
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Ochiai, Hiromichi: *See*—
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Oda, Mitsuyuki: *See*—
Okai, Toshihiro; Okumura, Yoshiaki; Oda, Mitsuyuki; Yamamoto, Takashi; and Kuwajima, Teruaki, 4,885,032, Cl. 75-251.000.

Odagawa, Yoshimoto; and Yanagisawa, Yasushi, to TDK Corporation. Magnetic tilt sensor with permanent magnet surrounding magnetic sensing element. 4,885,535, Cl. 324-207.000.

ODL, Incorporated: *See*—
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Oellerer, Friedrich: *See*—
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Hermann, Lawrence W.; and Offield, Donald G., 4,885,803, Cl. 455-603.000.

Ogawa, Shinya: *See*—
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Ogawa, Tomoya: *See*—
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Ogawa, Toru: *See*—
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Ogawa, Toshio; Nishiyama, Hisashi; Katakura, Kageyoshi; and Ishikawa, Shizuo, to Hitachi Medical Corporation. Ultrasonic doppler meter. 4,884,448, Cl. 73-597.000.

Ogiu, Hisao: *See*—
Kimura, Kenji; Hibino, Hiroki; Nisikori, Toshiaka; Ogiu, Hisao; Kidawara, Atsushi; Yabe, Hisao; Takamura, Koji; Yoshinaga, Jun; Kato, Shinichi; and Nakamura, Takeaki, 4,885,635, Cl. 358-98.000.

Ogura, Mototsugu: *See*—
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Oh, Yang H. Rotary sprayer for an automatic dishwasher. 4,884,585, Cl. 134-176.000.

Ohashi, Toshio, to Nissan Motor Company, Limited. Valve actuating arrangement. 4,884,780, Cl. 251-11.000.

Ohba, Akio, to Sony Corporation. Method of forming curved surfaces and the apparatus. 4,885,702, Cl. 364-521.000.

Ohba, Kiyoshi: *See*—
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Ohi Seisakusho Co., Ltd.: *See*—
Kobayashi, Satoshi; and Kato, Koji, 4,884,668, Cl. 192-4.00A.

Ohkubo, Takemi, to Esu-Oh Giken Co., Ltd. Method for producing article including press-dried plant. 4,885,037, Cl. 156-57.000.

Ohno, Kenji: *See*—
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Ohno, Kiichi: *See*—
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Ohsawa, Hidetoshi: *See*—
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Ohta, Masahiko, to Seiko Instruments Inc. Thin film display device with thin amorphous channel. 4,885,616, Cl. 357-23.700.

Ohtsuka, Yoshihiro: *See*—
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Ohuchi, Yutaka: *See*—
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Oikawa, Hideaki, to Pentel Kabushiki Kaisha. Mechanical pencil with latching chuck actuator. 4,884,911, Cl. 401-65.000.

Okabe, Kazuhiko: *See*—
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Okabe, Takeaki: *See*—
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Okada, David N.: *See*—
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Okai, Makoto; Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; and Chinone, Naoki, to Hitachi, Ltd. Semiconductor laser device of variable wavelength type. 4,885,753, Cl. 372-45.000.

Okai, Toshihiro; Okumura, Yoshiaki; Oda, Mitsuyuki; Yamamoto, Takashi; and Kuwajima, Teruaki, to Nippon Paint Co., Ltd. Aluminum flake pigment. 4,885,032, Cl. 75-251.000.

Okamoto, Kenji; and Kida, Yasushi, to Sumitomo Electric Industries, Ltd. High-speed digital image processing apparatus. 4,885,787, Cl. 382-54.000.

Okamura, Masatoshi: *See*—
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Okano, Kazuyuki: *See*—
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Okazawa, Takeshi, to Nec Corporation. Stacked metal-insulator semiconductor device. 4,885,624, Cl. 357-42.000.
Oki Electric Industry Co., Ltd.: *See*—
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Okino, Yoshiharu, to Fuji Photo Film Co., Ltd. Picture recording apparatus. 4,885,608, Cl. 355-107.000.
Oklahoma Medical Research Foundation: *See*—
Nawroth, Peter P.; Stern, David M.; and Wilner, George D., 4,885,277, Cl. 514-15.000.
Okonogi, Hirotaka: *See*—
Kawakami, Shin; Haruyama, Satoshi; Okonogi, Hirotaka; Nikaido, Katutomo; and Mukai, Norito, 4,885,431, Cl. 174-68.500.
Okumura, Fujio, to NEC Corporation. Liquid crystal light valve showing an improved display contrast. 4,884,875, Cl. 350-342.000.
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Okumura, Yoshiaki: *See*—
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Okura Yusoki Kabushiki Kaisha: *See*—
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Okuzumi, Fumihiro; and Matsuda, Junichi, to Asahi Diamond Industrial Co., Ltd. Method for the preparation of a diamond-clad machining tool. 4,884,476, Cl. 76-101.00R.
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Oldham, Oliver G.: *See*—
Read, Edgar L.; Grant, Elwyn E.; Keto, Gary A.; Lin, Sharlene C.; Morgan, James D.; Nimon, Robert E.; Oldham, Oliver G.; Adams, Allen R., Jr.; and Salmones, Jose A., 4,885,739, Cl. 370-58.100.
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Pennington, B. Timothy; and Katz, Lawrence E., 4,885,412, Cl. 568-469.900.
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Olivares, Jose A.: *See*—
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Oliver, Bruce J., to Aquest, Inc. Drinking water delivery system with purity indicator. 4,885,081, Cl. 210-87.000.
Olmstead, Gordon: *See*—
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Olympus Optical Co., Ltd.: *See*—
Horiguchi, Toshio; Akatsuka, Yuichiro; and Tanaka, Hisakatsu, 4,885,458, Cl. 235-454.000.
Iwasa, Kazuyuki; and Nakazawa, Hirotsugu, 4,885,600, Cl. 354-400.000.
Kimura, Kenji; Hibino, Hiroki; Nisikori, Toshiaka; Ogiu, Hisao; Kidawara, Atsushi; Yabe, Hisao; Takamura, Koji; Yoshinaga, Jun; Kato, Shinichi; and Nakamura, Takeaki, 4,885,635, Cl. 358-98.000.
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O'Mara, Richard C.: *See*—
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O'Meara, John R., to CP Packaging Inc. Container and closure assembly. 4,884,703, Cl. 215-6.000.
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Harada, Yasuhiro; Nobumoto, Kazutoshi; Nishimura, Eizi; and Onaka, Toru, 4,884,651, Cl. 180-197.000.
Onda, Mamoru: *See*—
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Miyamori, Takao; Numazawa, Ryozo; Sakimae, Akihiro; and Onishi, Hisao, 4,885,244, Cl. 435-101.000.
Onishi, Masayoshi; Naitou, Yasuo; and Yasukawa, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Cruise control apparatus. 4,884,649, Cl. 180-179.000.
Ono, Hiroshi; and Kasuga, Takaharu, to Mitsui Toatsu Chemicals, Incorporated. Production process of 2-chloropropionaldehyde. 4,885,400, Cl. 568-454.000.
Onoda, Sachio: *See*—
Fujitani, Makoto; Hirabayashi, Masashi; Honda, Hideo; Machida, Hiroshi; Kondo, Masami; and Onoda, Sachio, 4,884,956, Cl. 418-15.000.
Onodera, Yumiko: *See*—
Ishizaki, Takaharu; Igarashi, Taizo; Urano, Yasuo; and Onodera, Yumiko, 4,885,008, Cl. 44-62.000.
Onoue, Toshinobu, to Tochigifujisangyo Kabushiki Kaisha. Power transmission apparatus. 4,884,470, Cl. 74-710.500.
Ootaka, Kazuto: *See*—
Inaba, Shigemitsu; Ootaka, Kazuto; and Maeda, Akira, 4,884,978, Cl. 439-352.000.
Ootoshi, Hirokazu: *See*—
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Orc Manufacturing Co., Ltd.: *See*—
Adachi, Nobuo; and Ogawa, Shinya, 4,885,604, Cl. 355-30.000.
Oritani, Atsushi, to Fujitsu Limited. Buffer amplifier circuit. 4,885,479, Cl. 307-443.000.
Orth, Charles M.: *See*—
Simcoe, Steven B.; Orth, Charles M.; and VanDaele, John J., 4,885,443, Cl. 200-296.000.
Ortho Pharmaceutical Corporation: *See*—
Press, Jeffery B.; and Hajos, Zoltan, 4,885,300, Cl. 514-258.000.
Osada, Hiroshi, to Nifco, Inc. Muffler. 4,884,657, Cl. 181-258.000.
Osaka, Shuichi: *See*—
Imanaka, Asaji; Fujiwara, Tatsuo; and Osaka, Shuichi, 4,885,693, Cl. 364-426.020.
Osamu, Komazawa: *See*—
Aoki, Kohji; Yasuda, Tomio; Masanori, Sugiyama; and Osamu, Komazawa, 4,885,566, Cl. 340-457.100.
Osinski, Kazimierz; and Voors, Ingrid J., to U.S. Philips Corporation. Method of manufacturing a semiconductor device, in which metal silicide is provided in a self-registered manner. 4,885,259, Cl. 437-41.000.
Osther, Kurt B.; and Dyll, Louis M., to 501 Bio-Research Laboratories, Inc. Method for rapid and sensitive detection of HIV-1 antibodies. 4,885,235, Cl. 435-5.000.
Osthus, Harold L.: *See*—
Vaida, Robert M.; Osthus, Harold L.; and Kuchta, Richard, 4,884,510, Cl. 104-91.000.
Ostwald, Robert: *See*—
Bogenschutz, August F.; Jostan, Josef L.; and Ostwald, Robert, 4,885,053, Cl. 156-635.000.
Ota, Akiho: *See*—
Iizuka, Takao; and Ota, Akiho, 4,884,961, Cl. 425-195.000.
Otabe, Kisaburo: *See*—
Morita, Izuru; Kishitani, Keisuke; Kajitani, Masayoshi; Tozawa, Shoji; Satoh, Masanori; Otabe, Kisaburo; and Onda, Mamoru, 4,884,398, Cl. 60-274.000.
Otis Elevator Company: *See*—
Rivera, James A., 4,884,673, Cl. 198-328.000.
Otsubo, Kazumi, to Honda Giken Kogyo Kabushiki Kaisha. Gas damped deceleration switch. 4,885,439, Cl. 200-61.45R.
Ott, Karl-Heinz: *See*—
Eichenauer, Herbert; Pischtschan, Alfred; and Ott, Karl-Heinz, 4,885,337, Cl. 525-75.000.
Ouvrard, Pierre-Louis; and Dueme, Philippe, to Electronique Serge Dassault. Microwave delay circuit having a bridge-T circuit. 4,885,562, Cl. 333-139.000.
Owen, Hartley: *See*—
Harandi, Mohsen N.; and Owen, Hartley, 4,885,421, Cl. 585-403.000.
Oya, Eiichi: *See*—
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 4,885,022, Cl. 71-86.000.
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Nakakura, Hirofumi; Shibata, Morio; Ishikawa, Haruo; Nakano, Akihisa; Hiroto, Hiromi; and Oyabu, Hajime, 4,885,176, Cl. 426-19.000.
Oyama, Takuji: *See*—
Uramoto, Joshin; Suzuki, Koichi; Oyama, Takuji; and Kojima, Hiroyasu, 4,885,068, Cl. 204-192.110.
Ozagir, Ozcan; and Proffitt, Raymond, to Celmac Limited. Door and handle assembly. 4,884,834, Cl. 292-350.000.
Ozawa, Akira; Kousaka, Tomomi; Suzuki, Hideo; and Murakami, Masatoshi, to Honda Giken Kogyo Kabushiki Kaisha. Tool changer. 4,884,332, Cl. 29-568.000.
Packaging Corporation of America: *See*—
Nederveld, Terrill L., 4,884,739, Cl. 229-109.000.
Nederveld, Terrill L., 4,884,741, Cl. 229-157.000.
Padgaonkar, Arvind J., to Ford Motor Company. Automotive heating system with multiple independent heat sources. 4,884,744, Cl. 237-12.30R.
Paffhausen, Hans; Hogarth, Ian; Scott, Andrew; and Mackintosh, Christine, to Caribonum Ltd. Overlappingly overstrikeable ribbon and use thereof in continuously full cassettes. 4,884,908, Cl. 400-241.200.

Page, Billie J.: *See—*
Bokisa, George S.; and Page, Billie J., 4,885,064, Cl. 204-44.400.

Page, Ronald D., to Mobil Oil Corp. Method and apparatus for monitoring ice masses. 4,885,591, Cl. 342-450.000.

Pak, Kyoungsik. Mathematic teaching aid. 4,884,973, Cl. 434-191.000.

Palmer, Donald E. Interconnection for high fidelity signals. 4,885,555, Cl. 333-12.000.

Pandel, Inc.: *See—*
Nowell, Gilbert S.; and Tenzer, Frederick D., 4,885,659, Cl. 361-212.000.

Pao, David S. C. Rotating stylus cystitome. 4,885,004, Cl. 604-22.000.

Paragon Electric Company, Inc.: *See—*
Bos, Peter J., 4,884,414, Cl. 62-156.000.

Parish, Harlie A.; and Purcell, William P., to Molecular Design International. Topical transretinoids for treatment of acne and skin diseases. 4,885,311, Cl. 514-549.000.

Park, Eugene S.: *See—*
Newkirk, Marc S.; Kantner, Robert C.; and Park, Eugene S., 4,884,737, Cl. 228-121.000.

Park, Michael C.: *See—*
O'Brien, Dennis J.; Hanson, Paul G.; Klarquist, Thomas D.; Nepple, Bruce C.; Park, Michael C.; and Rosas, Robin R., 4,885,763, Cl. 379-67.000.

Parker, Donald O., to Parker Engineering & Manufacturing Co. Coin analyzer system and apparatus. 4,884,672, Cl. 194-318.000.

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Parker, Donald O., 4,884,672, Cl. 194-318.000.

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Schulze, Dieter, 4,884,451, Cl. 73-706.000.

Parker, Jeffrey R., to Lumitex, Inc. Fiber optic light emitting panel and method of making same. 4,885,663, Cl. 362-32.000.

Parker, William A.; Bartos, Thomas E.; and Stewart, William M., to Ford Motor Company. Automotive shock absorber with unitary striker plate and closure cap. 4,884,665, Cl. 188-322.170.

Parran, John J., Jr.; and Sakkab, Nabil Y., to Procter & Gamble Company, The. Anticalculus compositions using pyrophosphate salt. 4,885,155, Cl. 424-52.000.

Parschat, Lothar: *See—*
Pleschiutschnigg, Fritz-Peter; Von Schnakenburg, Joachim; Parschat, Lothar; and Stadler, Peter, 4,884,624, Cl. 164-454.000.

Parson, Brian J.; Shepherd, Roger M.; May, Michael D.; and Stewart, Graham, to Inmos Limited. Digital signal switch. 4,885,740, Cl. 370-60.000.

Paspek, Stephen C.: *See—*
Eppig, Christopher P.; Paspek, Stephen C.; and Stalzer, Richard B., 4,885,079, Cl. 208-13.000.

Pate, Gefry E.; Mullinax, Ronald L.; Sutton, Alexander G.; and Ross, Jeff E., to Pate Systems, Inc. Computer aided flood control modeling and management system. 4,885,706, Cl. 364-551.010.

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Patel, Praful J., to Chemcast Corporation. Method of making a dual durometer self-locking and sealing plug. 4,885,121, Cl. 264-255.000.

Patino, Hugo; Heard, George E.; Knudsen, Finn B.; and Gress, H. Stephen, to Adolph Coors Company. Process for preparing malt liqueur. 4,885,184, Cl. 426-592.000.

Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; by Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; by Guschina, Alevtina V., administrator; by Korobkova, Ljudmila S., administrator; and by Kuznetsova, Tatyana S., administrator. Method of the plasma jet remelting of a surface layer of a flat metal work having parallel side edges and apparatus for carrying out the method. 4,884,625, Cl. 164-495.000.

Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Kharchenko, Alexandr K.; and Unigovsky, Mikhail R. Machine for resistance butt welding of pipes. 4,885,450, Cl. 219-101.000.

Patrone, Anthony J.: *See—*
Harrison, Charles W.; Gerondale, Michael J.; Patrone, Anthony J.; and Ong, James O. Y., 4,885,062, Cl. 196-14.500.

Patterson, James V. Turf repair apparatus. 4,884,805, Cl. 273-32.00B.

Patton, Charles M.: *See—*
Eisenstein, Gabe L.; Grodd, Laurence W.; McClellan, Paul J.; Miller, Robert M.; Patton, Charles M.; and Wickes, William C., 4,885,714, Cl. 364-709.010.

Patton, Charles S.: *See—*
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Paul, Manfred: *See—*
Hoffmann, Kurt; Oberle, Hans-Dieter; Kraus, Rainer; Kowarik, Oskar; and Paul, Manfred, 4,885,748, Cl. 371-21.300.

Pauley, James D.; and Ripingill, Allen E., Jr., to B. I. Incorperated. Tag for use with personnel monitoring system. 4,885,571, Cl. 340-573.000.

Pauli, Heinrich: *See—*
Millauer, Wolfgang; Benz, Gottfried; Pauli, Heinrich; and Hoyss, Franz, 4,885,511, Cl. 318-434.000.

Pauza, William V.: *See—*
Fleming, David F.; Kerlin, Harold W.; Pauza, William V.; and Sheesley, Wilmer L., 4,884,982, Cl. 439-620.000.

Pawloski, Chester E., to Dow Chemical Company, The. Phosphatephosphites acid halides. 4,885,381, Cl. 558-155.000.

Pea, Kevin I.: *See—*
Tenniswood, David M.; Pea, Kevin I.; and Loeck, Steven M., 4,885,437, Cl. 200-31.00R.

Pearcy, Frank H. Multi-compartment receptacle for fishing tackle or other items. 4,884,360, Cl. 43-54.100.

Pearson, Erich H. Waste treatment system. 4,884,756, Cl. 241-42.000.

Pedersen, Palle. Locking device. 4,884,833, Cl. 292-316.000.

Peglion, Jean L.; Poignant, Jean C.; and Vian, Joel, to ADIR Et Cie. 2,4,5,6,7,8-Hexahydronaphtho[2,3-b]furan useful as an intermediate. 4,885,373, Cl. 549-458.000.

Peil, William, to General Electric Company. Pulse-by-pulse current mode controlled power supply. 4,885,671, Cl. 363-17.000.

Peleg, Kalman, to Peleg, Kaman. Method and apparatus for automatically inspecting and classifying different objects. 4,884,696, Cl. 209-545.000.

Peleg, Kaman: *See—*
Peleg, Kalman, 4,884,696, Cl. 209-545.000.

Pelzl, Leo; Seidel, Peter; and Zell, Karl, to Siemens Aktiengesellschaft. Centering strip for use with a backplane printed circuit board. 4,884,975, Cl. 439-78.000.

Penman, Sheldon; and Fey, Edward G., to Massachusetts Institute of Technology. Method for determining tissue of origin and presence and extent of cellular abnormalities. 4,885,236, Cl. 435-6.000.

Pennebaker, William B.; Mitchell, Joan L.; and Mintzer, Frederick C., to International Business Machines Corporation. Soft copy display of facsimile images. 4,885,576, Cl. 340-793.000.

Pennebaker, William B.: *See—*
Anderson, Karen L.; Pennebaker, William B.; and Pennington, Keith S., 4,885,786, Cl. 382-47.000.

Pennington, B. Timothy, to Olin Corporation. Alkylene oxides production from alkanes or alkylaromatics using molten nitrate salt catalyst. 4,885,374, Cl. 549-532.000.

Pennington, B. Timothy; and Katz, Lawrence E., to Olin Corporation. Aldehyde production from alkylaromatics using molten nitrate salt catalyst. 4,885,412, Cl. 568-469.900.

Pennington, Keith S.: *See—*
Anderson, Karen L.; Pennebaker, William B.; and Pennington, Keith S., 4,885,786, Cl. 382-47.000.

Pennink, Hans, deceased (by Pennink, Liv, executrix), to Atlas Copco Aktiebolag. Thrust monitoring and balancing apparatus. 4,884,942, Cl. 415-104.000.

Pennink, Liv, executrix: *See—*
Pennink, Hans, deceased, 4,884,942, Cl. 415-104.000.

Pennock, John L., to Seagate Technology, Inc. Voice coil actuator positioning amplifier. 4,885,517, Cl. 318-678.000.

Pennwalt Corporation: *See—*
Myers, Terry N., 4,885,347, Cl. 525-447.000.

Pentel Kabushiki Kaisha: *See—*
Oikawa, Hideaki, 4,884,911, Cl. 401-65.000.

Perazzi, Edgar. Set of construction elements. 4,884,920, Cl. 405-284.000.

Perdelwitz, Lee E., Jr.; and Hanke, David E., to Weyerhaeuser Company. Infant car seat liner. 4,885,200, Cl. 428-136.000.

Perkin-Elmer Corporation, The: *See—*
Young, Lydia J., 4,885,472, Cl. 250-491.100.

Perkins, Raymond T.: *See—*
Woodbury, Richard C.; Perkins, Raymond T.; and Thorne, James M., 4,885,055, Cl. 156-647.000.

Permaban Southeast, Inc.: *See—*
Ljungkvist, Stig-Åke; and Johansson, Lennart, 4,884,384, Cl. 52-741.000.

Pernot, Daniel: *See—*
Muraro, Pierre; and Pernot, Daniel, 4,884,675, Cl. 198-358.000.

Perritaz, Francis: *See—*
Kramer, Andreas; and Perritaz, Francis, 4,885,346, Cl. 525-426.000.

Perry, Kenneth J.; Thefaine, Yannick J.; Hailpern, Brent T.; Hoevel, Lee W.; and Shea, Dennis G., to International Business Machines Corporation. In band connection establishment for a multiple multidrop network. 4,885,578, Cl. 340-825.520.

Pesyna, Kenneth M.: *See—*
Ward, Eric J.; Worley, Kevin L.; and Pesyna, Kenneth M., 4,884,748, Cl. 239-265.370.

Peters, Edward N.: *See—*
Fox, Daniel W.; and Peters, Edward N., 4,885,407, Cl. 568-724.000.

Peters, Loren W.: *See—*
Hall, James W.; Popelier, Maurice A.; Klimmer, Josef W.; West, Neil L.; and Peters, Loren W., 4,884,994, Cl. 460-66.000.

Peters, Rolf: *See—*
Karbach, Alfred; Schaub, Georg; and Peters, Rolf, 4,884,408, Cl. 60-667.000.

Peters, Steven J.: *See—*
Lamberty, Bernard J.; and Peters, Steven J., 4,885,556, Cl. 333-21.00A.

Peterson, Dennis R.: *See—*
Zowarka, Raymond C.; Weeks, Damon A.; Weldon, William F.; Gully, John H.; Upshaw, Jim L.; Spann, Mike L.; and Peterson, Dennis R., 4,884,489, Cl. 89-8.000.

Peterson, Richard H., to Graco Inc. Reel-less dispense console. 4,884,592, Cl. 137-234.600.

Pethrick, Richard A.: *See—*
Affrossman, Stanley; Bakhshaee, Massoud; Pethrick, Richard A.; and Sherrington, David C., 4,885,344, Cl. 525-302.000.

Petrini, Guido: *See—*
Gardano, Andrea; Casagrande, Francesco; Foa, Marco; Petrini, Guido; Barisone, Riccardo; and Chapoy, Lawrence, 4,885,409, Cl. 568-834.000.

Petro-Canada, Inc.: *See*—
Tomoda, Toshimasa; Badono, Shinji; and Komaru, Masaki, 4,885,759, Cl. 378-53.000.

Pettersson, Sven A.: *See*—
Ahad, Munir J.; and Pettersson, Sven A., 4,884,725, Cl. 222-639.000.

Pettit, Edgar E., to Lil' Duke Sprinkler, Inc. Lawn sprinkler. 4,884,751, Cl. 239-468.000.

Peychev, Vlayko S.: *See*—
Beyazov, Yordan Y.; Nenov, Sasho G.; and Peychev, Vlayko S., 4,884,459, Cl. 73-861.520.

Pfister, Gregory F.: *See*—
Anthony, John H.; Brantley, William C., Jr.; McAuliffe, Kevin P.; Norton, Vern A.; and Pfister, Gregory F., 4,885,680, Cl. 364-200.000.

Pfizer Inc.: *See*—
Marfat, Anthony, 4,885,370, Cl. 548-486.000.
Ray, Stephen J.; and Richardson, Kenneth, 4,885,294, Cl. 514-227.800.

Pham, Hieu T.: *See*—
Tschang, Pin S.; Pham, Hieu T.; and Kieffer, Kenneth D., 4,885,597, Cl. 364-519.000.

Pham, Hoa; and Max, Robert C., to Tandem Computers Incorporated. Electronic module interlock and extraction mechanism. 4,885,436, Cl. 200-50.00A.

Pham, Lucien; and Taillani, Jean-Claude C., to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A.". Inter-shaft bearing for multiple body turbo-engines. 4,884,903, Cl. 384-563.000.

Pham, Tu-Anh; and Lancaster, Gerald M., to Dow Chemical Company, The. Foamable thermoplastic polymers and a method for foaming. 4,885,315, Cl. 521-50.500.

Philippe, Maige, to SGS-Thomson Microelectronics S.A. Demagnetization monitoring device for a switching power supply with a primary and a secondary regulation. 4,885,673, Cl. 363-21.000.

Phillips, Charles W.: *See*—
Moskowitz, David; and Phillips, Charles W., 4,885,030, Cl. 75-238.000.

Phillips Petroleum Company: *See*—
Brown, Ronald E.; Hogan, Robert J.; Coombs, Daniel M.; and Kukes, Simon G., 4,885,080, Cl. 208-218.000.
Cregg, James M., 4,885,242, Cl. 435-68.000.
Mumallah, Naim A.; and Moradi-Araghi, Ahmad, 4,884,636, Cl. 166-295.000.

Phosphate Engineering & Construction Co., Inc.: *See*—
Erickson, William R.; Stain, Donald B.; and Wilson, James D., 4,885,148, Cl. 423-309.000.

Photron Pty. Ltd.: *See*—
Green, James G., 4,885,504, Cl. 313-618.000.

Picker International, Inc.: *See*—
Sones, Richard A.; Tesic, Mike M.; and Vidmar, James F., 4,885,761, Cl. 378-197.000.

Pieper, Richard L.: *See*—
Huber, Floyd M.; Pieper, Richard L.; and Tietz, Anthony J., 4,885,243, Cl. 435-71.300.

Piepmeier, Arthur L., Jr.; and Nunally, Charles M., to Porelon, Inc. Method and apparatus for printing a light scannable image. 4,884,505, Cl. 101-492.000.

Pierson, Bruce A.: *See*—
Kolodesh, Michael S.; Cash, Walter, Jr.; Davis, Jerry E.; Gosselin, Peter G.; Kock, Ronald W.; Pierson, Bruce A.; Reiboldt, H. Norman; Sabatelli, David A.; and Toms, Douglas, 4,885,182, Cl. 426-482.000.

Pioneer Electric Corporation: *See*—
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Pioneer Electronic Corporation: *See*—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,885,644, Cl. 358-342.000.

Piotrowski, Andrzej M.; and Malpass, Dennis B., to Texas Alkyls, Inc. Hydrocarbon-soluble complexes of magnesium alkoxides with magnesium aryl oxides. 4,885,406, Cl. 568-716.000.

Pirault, Jean P.; Rowbotham, Mervyn; and Biggs, David A., to Ford Motor Company. Fracture splitting of light metal components. 4,884,900, Cl. 384-434.000.

Pischtschan, Alfred: *See*—
Eichenauer, Herbert; Pischtschan, Alfred; and Ott, Karl-Heinz, 4,885,337, Cl. 525-75.000.

Pitney Bowes Inc.: *See*—
Nobile, John R., 4,884,503, Cl. 101-233.000.

Plaks, Norman: *See*—
Sparks, Leslie E.; and Plaks, Norman, 4,885,139, Cl. 422-169.000.

Plas, Danielle: *See*—
Kiechel, Jean-Rene ; Acezat-Mispelter, Francoise; and Plas, Danielle, 4,885,305, Cl. 514-356.000.

Plasticon Patents, S.A.: *See*—
Strassheimer, Herbert, 4,885,197, Cl. 428-36.920.

Pleschiutschnigg, Fritz-Peter; Von Schnakenburg, Joachim; Parschat, Lothar; and Stadler, Peter, to Mannesmann Aktiengesellschaft. Process on a continuous casting machine to produce strands. 4,884,624, Cl. 164-454.000.

Plessey Overseas Limited: *See*—
Dakin, John P., 4,885,462, Cl. 250-227.000.

Plummer, Raymond G., to De3ilbiss Company, The. Electrostatic paint spray system with dual voltage isolating paint reservoirs. 4,884,752, Cl. 239-691.000.

Pneumo Abex Corporation: *See*—
Tootle, James N., 4,884,493, Cl. 92-128.000.

Pochopien, Kevin P.: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; White, Danny R.; and Johnson, William B., 4,885,130, Cl. 419-12.000.

Podd, Victor T. Bulkhead and lining systems for cargo containers. 4,884,722, Cl. 222-535.000.

Podszun, Wolfgang; and Waniczek, Helmut, to Bayer Aktiengesellschaft. Pigment coated with polycyanoacrylate and a process for coating pigments. 4,885,191, Cl. 427-212.000.

Pohlmann, Franz, to Rose Elektrotechnik GmgH & Co. K.G. Housing for electrical and electronic components. 4,884,715, Cl. 220-76.000.

Poignant, Jean C.: *See*—
Peglion, Jean L.; Poignant, Jean C.; and Vian, Joel, 4,885,373, Cl. 549-458.000.

Polak, Thomas A.: *See*—
Neale, Michael J.; and Polak, Thomas A., 4,884,536, Cl. 123-197.0AC.

Polonio, John D. Interconnection mechanisms for electronic components. 4,885,126, Cl. 361-399.000.

Polyplastics Co., Ltd.: *See*—
Nitoh, Toshikatsu; and Tokushige, Kazutomo, 4,885,321, Cl. 523-219.000.

Pomidor, Patricia B., to Chevron Research Company. Herbicidal arylmethylenesulfonamido-acetamide and thioacetamide derivatives. 4,885,027, Cl. 71-103.000.

Popelier, Maurice A.: *See*—
Hall, James W.; Popelier, Maurice A.; Klimmer, Josef W.; West, Neil L.; and Peters, Loren W., 4,884,994, Cl. 460-66.000.

Popp, Eugen: *See*—
Risitano, Antonio; Rosario, Lanzafame; and Popp, Eugen, 4,884,533, Cl. 123-25.00C.

Porelon, Inc.: *See*—
Piepmeier, Arthur L., Jr.; and Nunally, Charles M., 4,884,505, Cl. 101-492.000.

Porter, Benny R.; and Bowers, Doyle G., to Arc Plan, Inc. Method and apparatus for hydraulic turbine rotation for repair. 4,884,326, Cl. 29-156.80R.

Powers, Richard G.; Currier, Joseph G.; and Zeets, Joseph S., to Marlen Research Corporation. Compact twin piston pump. 4,884,594, Cl. 137-625.480.

Prakash, Ravinder; and Wolfe, Larry L., to International Business Machines Corporation. Scanner for use in multiple spot laser electrophotographic printer. 4,884,857, Cl. 350-6.800.

Pratt, Charles F.: *See*—
Boutni, Omar M.; and Pratt, Charles F., 4,885,336, Cl. 525-67.000.

Pratt & Whitney Canada, Inc.: *See*—
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Pray, Robert H.; Ramler, Donald W.; and Juliber, Curtis B., to Honeywell Inc. Automated building control design system. 4,885,694, Cl. 364-464.010.

Press, Jeffery B.; and Hajos, Zoltan, to Ortho Pharmaceutical Corporation. 4-Substituted pyrazolo[3,4-D]pyrimidine derivatives. 4,885,300, Cl. 514-258.000.

Presto Industries, Inc.: *See*—
Hedrington, James A., 4,884,755, Cl. 241-37.500.

Prestolite Wire Corporation: *See*—
Sturdevan, Ronald P., 4,884,977, Cl. 439-125.000.

Preusker, Rosel; and Preusker, Werner, to Confon AG. Adaptor for screwheads and the like. 4,884,933, Cl. 411-177.000.

Preusker, Werner: *See*—
Preusker, Rosel; and Preusker, Werner, 4,884,933, Cl. 411-177.000.

Prewo, Karl M.; Nardone, Vincent C.; and Strife, James R., to United Technologies Corporation. Microstructurally toughened metal matrix composite article and method of making same. 4,885,212, Cl. 428-552.000.

Price, Anthony G.: *See*—
Campbell, Roy; and Price, Anthony G., 4,884,494, Cl. 92-129.000.

Prochnow, Robert R.: *See*—
Strandholm, John J.; Prochnow, Robert R.; Miller, Mark S.; Woodford, Lawrence E.; and Neunaber, Steven M., 4,885,183, Cl. 426-582.000.

Procter & Gamble Company, The: *See*—
Parran, John J., Jr.; and Sakkab, Nabil Y., 4,885,155, Cl. 424-52.000.
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Proctor & Gamble Company, The: *See*—
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Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

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Kane, Mark E.; Shockley, James F.; and Eck, Henry H., 4,885,689, Cl. 364-424.010.

Purcell, William P.: *See*—
Parish, Harlie A.; and Purcell, William P., 4,885,311, Cl. 514-549.000.

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McAulay, Robert J.; and Quatieri, Thomas F., Jr., 4,885,790, Cl. 381-36.000.

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Bagley, Brian G.; and Quinn, William E., 4,885,186, Cl. 427-38.000.

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Lorenz, Dotsch; Hofer, Karl-Heinz; Retrayt, Jean-Louis; and Kull, Bernd, 4,884,787, Cl. 266-270.000.

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Steinkamp, John O.; Ball, Garry L.; and Radke, Daniel D., 4,884,940, Cl. 414-715.000.

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Ragle, Clyde M. Transmitter attachment for hunting arrows. 4,885,800, Cl. 455-98.000.

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Arenal, Mark G.; and Murphy, Robert A., 4,884,878, Cl. 350-429.000.

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Pray, Robert H.; Ramler, Donald W.; and Juliber, Curtis B., 4,885,694, Cl. 364-464.010.

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Gallucci, Robert R.; Wroczynski, Ronald J.; Jones, James F.; and Rasch, Stefan F., 4,885,335, Cl. 525-67.000.

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Amoyal, William E.; and Franckx, Joris R. I., 4,885,432, Cl. 174-92.000.
Au, Andrew N., 4,885,457, Cl. 219-548.000.
Ellis, Roger H.; Walton, A. Christian; and Tomita, Akira, 4,884,864, Cl. 350-96.210.
Tight, Dexter C., Jr.; and Moisson, Marc F., 4,885,194, Cl. 428-34.900.

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McCarthy, Brian D.; and Regan, Bernard J., 4,885,725, Cl. 367-129.000.

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Walzer, Winfried; and Reistle, Wolfgang, 4,884,475, Cl. 74-862.000.

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Remers, William A., to University Patents, Inc. Mitomycin analogs. 4,885,304, Cl. 514-338.000.

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Grove, Lee A., 4,884,595, Cl. 137-636.100.

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Miner, Jonathan L.; Lacher, Vernon R.; Rescigno, Gerald J.; Swim, William B.; Gierke, Martin P.; and Hahn, David A., 4,884,314, Cl. 15-344.000.

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Higuchi, Toshiro, 4,884,329, Cl. 29-407.000.

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Levine, Sol; and Sanchez, Hernando, 4,884,719, Cl. 221-25.000.

Revol, Gerard; Roillet, Maxime; and Barthomeuf, Jean-Paul, to Societe de Prospection et d'Invention Techniques, S. A. Suspension peg. 4,884,931, Cl. 411-57.000.

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Kruse, Heinz-Josef; Karius, Klaus D.; and Sippel, Achim, 4,884,508, Cl. 102-524.000.

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Reddel, Roger R.; Yang, Ke; Rhim, Johng S.; Brash, Douglas; Su, Robert T.; Lechner, John F.; Gerwin, Brenda I.; Harris, Curtis C.; and Amstad, Paul, 4,885,238, Cl. 435-29.000.

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Wolfberg, Larry; Wolfberg, Brent; and Rhoads, Jan E., 4,885,685, Cl. 364-401.000.

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Ratton, Serge; and Desmurs, Jean-Roger, 4,885,408, Cl. 568-779.000.

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Rich, Ronald R., to Water Technologies, Inc. System for separating solutions. 4,885,095, Cl. 210-636.000.

Richards, Stephen L.: *See—*
Mabey, Kent W.; Boska, Joseph M.; and Richards, Stephen L., 4,885,632, Cl. 358-84.000.

Richardson, Hubert, Jr., to Tecumseh Products Company. Scroll compressor having oil-actuated compliance mechanism. 4,884,955, Cl. 418-1.000.

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Ray, Stephen J.; and Richardson, Kenneth, 4,885,294, Cl. 514-227.800.

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Mayer, Kurt; Richey, Volker; and Schneider, Hans-Peter, 4,885,530, Cl. 324-61.00R.

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Rick, Paul N.: *See—*
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Rickerby, David S.: *See—*
Coad, Joseph P.; Rickerby, David S.; and Warrington, Philip, 4,885,069, Cl. 204-192.310.

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Enoki, Shigekazu; Sawayama, Noboru; Katoh, Shunji; and Kimura, Noriyuki, 4,885,223, Cl. 430-122.000.
Katoh, Kazuyuki, 4,885,610, Cl. 355-233.000.
Koichi, Yasushi; Mizuishi, Haruzi; Funaki, Mutuko; and Fujioka, Tetsuya, 4,885,466, Cl. 250-324.000.
Kudoh, Kunio, 4,885,613, Cl. 355-310.000.
Satoh, Tsumori; and Koichi, Yasushi, 4,885,612, Cl. 355-305.000.
Yamashita, Hiroshi; and Muto, Kenkichi, 4,885,350, Cl. 526-201.000.
Yano, Takashi, 4,885,742, Cl. 370-85.200.

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Rijnders, Willem, to Hunter Douglas International N.V. Ceiling panel carrier adapter member. 4,884,383, Cl. 52-489.000.

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Ripingill, Allen E., Jr.: *See—*
Pauley, James D.; and Ripingill, Allen E., Jr., 4,885,571, Cl. 340-573.000.

Rippel, Wally E., to California Institute of Technology. Forced air heat sink apparatus. 4,884,631, Cl. 165-185.000.

Risitano, Antonio; Rosario, Lanzafame; and Popp, Eugen. Method of and an arrangement for burning a liquid or gaseous fuel in a combustion chamber of an internal combustion engine. 4,884,533, Cl. 123-25.00C.

Rivera, James A., to Otis Elevator Company. Curved escalator with fixed center constant radius path of travel. 4,884,673, Cl. 198-328.000.

Rivero-Olmedo, Jose M. Expansion mechanism for meter box or meter yoke. 4,884,442, Cl. 73-201.000.

Rizzo, Thomas: *See—*
Tracy, David J.; Rizzo, Thomas; and Login, Robert B., 4,885,158, Cl. 424-69.000.

Roach, Robert E.: *See—*
Jones, Timothy A.; Kaluza, Thomas J.; and Roach, Robert E., 4,884,438, Cl. 73-153.000.

Robbins, Daniel H., to Itek Graphix Corp. Vacuum transport and hold down belt for automatic camera. 4,885,606, Cl. 355-73.000.

Robert Bosch GmbH: *See—*
Konrath, Karl; Koester, Claus; Zibold, Karl; Schwarz, Manfred; Russeler, Karl-Friedrich; Krieger, Klaus; and Kupzik, Roland, 4,884,542, Cl. 123-370.000.
Stutzenberger, Heinz, 4,884,543, Cl. 123-387.000.

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Atalla, Martin M.; and Roberts, Alan, 4,885,779, Cl. 380-56.000.

Roberts, Edgar, to A-1 Construction Company. System for electrical grounding. 4,885,428, Cl. 174-6.000.

Robertson, Jeffrey E.: *See—*
Austin, Edward B.; and Robertson, Jeffrey E., 4,885,684, Cl. 364-300.000.

Robertson, Perry J.: *See—*
Faris, Aziz I.; and Robertson, Perry J., 4,885,480, Cl. 307-448.000.

Robison, Robert L., to Eli Lilly and Company. Vancomycin-HCL solutions and the lyophilization thereof. 4,885,275, Cl. 514-8.000.

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Kjelgaard, Tom, 4,884,695, Cl. 206-631.200.

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Bungard, Kevin O., 4,884,832, Cl. 292-173.000.

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Rodi, Anton; and Blaser, Peter T., to Heidelberger Druckmaschinen AG. Cable lead-through device. 4,884,774, Cl. 248-56.000.

Roemer, Peter B.; Bottomley, Paul A.; and Edelstein, William A., to General Electric Company. Volume NMR coil for optimum signal-to-noise ratio. 4,885,539, Cl. 324-318.000.

Rohleder, Brian J. Ground/turf aerator. 4,884,637, Cl. 172-22.000.

Roillet, Maxime: *See—*
Revol, Gerard; Roillet, Maxime; and Barthomeuf, Jean-Paul, 4,884,931, Cl. 411-57.000.

Roller, George J.: *See—*
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Rolls Royce plc: *See—*
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Stewart, Peter A. E.; and Hawkesworth, Michael R., 4,885,464, Cl. 250-308.000.

Romann, Brigitte: *See—*
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Romanowski, Gerd: *See—*
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Ropak Manufacturing Company, Inc.: *See—*
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Rosas, Robin R.: *See—*
O'Brien, Dennis J.; Hanson, Paul G.; Klarquist, Thomas D.; Nepple, Bruce C.; Park, Michael C.; and Rosas, Robin R., 4,885,763, Cl. 379-67.000.

Rose, Connie. Disposable bibs, packaging and affixing tabs. 4,884,299, Cl. 2-49.00R.

Rose Elektrotechnik GmgH & Co. K.G.: *See—*
Pohlmann, Franz, 4,884,715, Cl. 220-76.000.

Roshdy, Constance E.; Cerwin, Robert J.; and Alpern, Marvin, to Ethicon, Inc. Retainer for surgical sutures. 4,884,681, Cl. 206-63.300.

Ross, Glenn D., to Sonoco Products Company. Fiberboard divider for shipping cartons. 4,884,740, Cl. 229-120.260.

Ross, Jeff E.: *See—*
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Rothgery, Eugene F.; and Manke, Steven A., to Olin Corporation. Substituted 5-amidotetrazoles as blowing agents in the production of cellular thermoplastic or rubber materials. 4,885,316, Cl. 521-90.000.

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Rounds, Stuart N.: *See—*
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Toja, Emilio; Gorini, Carlo; Barzaghi, Fernando; and Galliani, Giulio, 4,885,306, Cl. 514-425.000.
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Pirault, Jean P.; Rowbotham, Mervyn; and Biggs, David A., 4,884,900, Cl. 384-434.000.

Rucker, Thomas G.: *See—*
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Ruckman, Don: *See—*
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Rudat, Dieter: *See—*
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Rule, Mark, to Eastman Kodak Company. Process for preparation of aromatic dimers. 4,885,423, Cl. 585-427.000.

Ruprechter, Adam, to Fa. Rohren- und Pumpenwerk Rudolf Bauer Aktiengesellschaft. Sprinkler stand, particularly for nonlevel ground. 4,884,749, Cl. 239-280.500.

Rush, Pamela K.: *See—*
Brungardt, Clement L.; and Rush, Pamela K., 4,885,330, Cl. 524-447.000.

Russeler, Karl-Friedrich: *See—*
Konrath, Karl; Koester, Claus; Zibold, Karl; Schwarz, Manfred; Russeler, Karl-Friedrich; Krieger, Klaus; and Kupzik, Roland, 4,884,542, Cl. 123-370.000.

Russell, Larry A.: *See—*
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Rutz, Hans: *See—*
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Rydborn, Sten A. O. Thread signal emitter. 4,884,763, Cl. 242-148.000.

Ryobi Ltd.: *See—*
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Ryono, Denis E.; and Weller, Harold N., III, to E. R. Squibb & Sons, Inc. N-heterocyclic alcohol renin inhibitors. 4,885,292, Cl. 514-211.000.

Saarbergwerke Aktiengesellschaft: *See*—
Jorzyk, Sigurd; Scholl, Gerhard; Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,885,011, Cl. 55-242.000.

Sabatelli, David A.: *See*—
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Sachi, Leonard W.: *See*—
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Sadakata, Nobuyuki: *See*—
Sugimoto, Mamoru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Aoki, Shin'ya; and Nakagawa, Mikio, 4,885,273, Cl. 505-1.000.

Sadoff, Armin M.; Nelson, Richard C.; Smith, Gerald A.; Johnstonbaugh, Joseph; and Sadoff, Stevn J., to Sadoff, Armin M. Grip strength analyzer apparatus and method of using same. 4,884,445, Cl. 73-379.000.

Sadoff, Stevn J.: *See*—
Sadoff, Armin M.; Nelson, Richard C.; Smith, Gerald A.; Johnstonbaugh, Joseph; and Sadoff, Stevn J., 4,884,445, Cl. 73-379.000.

Sagawa, Toshimasa: *See*—
Sonoi, Takehiro; Sagawa, Toshimasa; Yamada, Okimasa; and Mizuno, Tetsuya, 4,885,398, Cl. 568-404.000.

Saibe, Seiichi: *See*—
Asao, Hideo; Yamazi, Satoru; and Saibe, Seiichi, 4,884,517, Cl. 112-112.000.

Saijo, Takao: *See*—
Fujita, Masafumi; Yamade, Yasushi; and Saijo, Takao, 4,885,605, Cl. 355-41.000.

Saito, Kenji, to Sumitomo Rubber Industries, Ltd. Depressed radial tire. 4,884,610, Cl. 152-454.000.

Saito, Masaki: *See*—
Nagatsuka, Yoshitaka; Saito, Masaki; and Kawabe, Yoshitaka, 4,885,465, Cl. 250-310.000.

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Sakamoto, Koozoo: *See*—
Nagai, Yasuo; Shimizu, Isao; Kimura, Masatoshi; Kaneko, Kenji; Okabe, Takeaki; and Sakamoto, Koozoo, 4,885,628, Cl. 357-68.000.

Sakamoto, Masaaki: *See*—
Uchiyama, Akira; Masaki, Yuuichi; Iwabuchi, Toshiyuki; Nomoto, Tsutomu; and Sakamoto, Masaaki, 4,885,622, Cl. 357-30.000.

Sakamoto, Takao, to Tachi-S Co., Ltd. Seat suspension device. 4,884,777, Cl. 248-588.000.

Sakamoto, Takao; and Takizawa, Kiyotaka, to Tachi-S Co., Ltd. Side support device for a vehicle seat. 4,885,513, Cl. 318-468.000.

Sakamoto, Yoshitaka: *See*—
Yamamoto, Michio; Kiriyama, Tsutomu; Sasaki, Noriaki; Sakamoto, Yoshitaka; and Ishimaru, Kenji, 4,885,057, Cl. 162-9.000.

Sakano, Shinji: *See*—
Okai, Makoto; Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; and Chinone, Naoki, 4,885,753, Cl. 372-45.000.

Sakata, Akiharu: *See*—
Kojima, Keiji; Torii, Shunichi; and Sakata, Akiharu, 4,885,678, Cl. 364-200.000.

Sakata, Kenichi: *See*—
Takeyasu, Hatsuichi; Sakata, Kenichi; and Yura, Fumitoshi, 4,884,856, Cl. 350-6.800.

Sakharnov, Vasily A.: *See*—
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Kharchenko, Alexandr K.; and Unigovsky, Mikhail R., 4,885,450, Cl. 219-101.000.

Sakimae, Akihiro: *See*—
Miyamori, Takao; Numazawa, Ryozo; Sakimae, Akihiro; and Onishi, Hisao, 4,885,244, Cl. 435-101.000.

Sakkab, Nabil Y.: *See*—
Parran, John J., Jr.; and Sakkab, Nabil Y., 4,885,155, Cl. 424-52.000.

Sakoda, Ryozo: *See*—
Seto, Kiyotomo; Tanaka, Sakuya; and Sakoda, Ryozo, 4,885,284, Cl. 514-89.000.

Sakoh, Mitsuo: *See*—
Ginnaga, Akihiro; Nishihara, Tsukasa; Kawahara, Tetsuo; Susumi, Sadao; Mizokami, Hiroshi; and Sakoh, Mitsuo, 4,885,359, Cl. 530-396.000.

Sakurada, Kenji: *See*—
Tamura, Zenji; Sakurada, Kenji; and Nakada, Akihiko, 4,884,597, Cl. 139-102.000.

Sakurai, Soichi: *See*—
Fukuda, Kyohei; Sakurai, Soichi; Hirata, Koji; and Mori, Shigeru, 4,884,879, Cl. 350-432.000.

Sakurai, Tomohisa: *See*—
Takehana, Sakae; Ueda, Yasuhiro; and Sakurai, Tomohisa, 4,884,557, Cl. 128-4.000.

Salmones, Jose A.: *See*—
Read, Edgar L.; Grant, Elwyn E.; Keto, Gary A.; Lin, Sharlene C.; Morgan, James D.; Nimon, Robert E.; Oldham, Oliver G.; Adams, Allen R., Jr.; and Salmones, Jose A., 4,885,739, Cl. 370-58.100.

Salzman, Gary C.; Gregg, Charles T.; Grace, W. Kevin; and Hiebert, Richard D., to United States of America, Energy. Biological particle identification apparatus. 4,884,886, Cl. 356-367.000.

Samson, Suellen M.: *See*—
Ingolia, Thomas D.; Queener, Stephen W.; Samson, Suellen M.; Skatrud, Paul L.; and Godfrey, Otis W., 4,885,251, Cl. 435-183.000.

Sanchez Gonzalez, Juan, to Balay, S.A. System for the induction heating of the electric plates of a cooker. 4,885,447, Cl. 219-10.770.

Sanchez, Hernando: *See*—
Levine, Sol; and Sanchez, Hernando, 4,884,719, Cl. 221-25.000.

Sandbank, Charles P., to British Broadcasting Corporation. Device for the remote control of a videorecorder or a videoreceiver. 4,885,579, Cl. 340-825.720.

Sanders, Richard S., to Intermedics, Inc. Cardiac pacer with patient-controlled exercise rate and method. 4,884,575, Cl. 128-419.0PG.

Sandoz Ltd.: *See*—
Brutsch, Emil, 4,884,693, Cl. 206-470.000.
Danner, Bernard; and Schleusener, Eckart, 4,885,325, Cl. 524-236.000.

Sandvik AB: *See*—
Brandt, Nils G. L.; and Byhlin, Ake B., 4,885,132, Cl. 419-15.000.
Sawicki, Wolfgang H.; Svensson, Tomas L.; Weck, Bernd K.; and Meier-Dornberg, Karl E., 4,884,461, Cl. 73-862.060.

Sanielevici, Sergio A., to Tektronix, Inc. High speed circuit with supporting auxiliary circuit. 4,885,545, Cl. 328-151.000.

Sankyo Manufacturing Company, Ltd.: *See*—
Kato, Heizaburou, 4,884,433, Cl. 72-446.000.

Sano, Konosuke: *See*—
Ishida, Masaaki; Miwa, Kiyoshi; Nakamori, Shigeru; and Sano, Konosuke, 4,885,245, Cl. 435-108.000.

Santa Barbara Research Center: *See*—
Doty, Fred P., 4,885,067, Cl. 204-157.600.
Eck, Robert E.; and Joyce, Richard J., 4,885,534, Cl. 324-158.00D.
Kosai, Kenneth, 4,885,619, Cl. 357-24.000.
Wellman, William H.; and Stannard, John E., 4,885,463, Cl. 250-252.100.

Sanyo Electric Co., Ltd.: *See*—
Tabuchi, Junichiro, 4,885,793, Cl. 388-810.000.
Takeuchi, Masaru; Gotoh, Kazuyuki; Wakisaka, Kenichiro; Honma, Kazuhiko; Fukatsu, Takeo; Nakano, Shoichi; and Kuwano, Yukinori, 4,885,226, Cl. 430-65.000.

Sartorius GmbH: *See*—
Knothe, Erich; and Melcher, Franz-Josef, 4,884,645, Cl. 177-180.000.

Sasaki, Noriaki: *See*—
Yamamoto, Michio; Kiriyama, Tsutomu; Sasaki, Noriaki; Sakamoto, Yoshitaka; and Ishimaru, Kenji, 4,885,057, Cl. 162-9.000.

Sasaki, Ryoichi: *See*—
Takaragi, Kazuo; Sasaki, Ryoichi; Shiraishi, Takayoshi; and Kurashiki, Nobuhiro, 4,885,777, Cl. 380-30.000.
Takaragi, Kazuo; Shiraishi, Takayoshi; and Sasaki, Ryoichi, 4,885,788, Cl. 380-23.000.

Sasatani, Tomohiko: *See*—
Shikakura, Akihiro; Takahashi, Koji; Takei, Masahiro; and Sasatani, Tomohiko, 4,885,637, Cl. 358-133.000.

Satake, Takeshi; and Imada, Yoshiyuki, to Mitsubishi Cable Industries, Ltd. Wear sensor. 4,884,434, Cl. 73-7.000.

Sato, Haruo: *See*—
Ikeuchi, Hisaaki; Madokoro, Manabu; Sato, Haruo; and Jodoi, Takashi, 4,885,123, Cl. 376-233.000.

Sato, Hiroaki: *See*—
Umeno, Hidenori; Kubo, Takashige; Hagiwara, Nobutaka; Sato, Hiroaki; and Sawamoto, Hideo, 4,885,681, Cl. 364-200.000.

Sato, Ichitaro: *See*—
Nakata, Tetsuro; Sato, Ichitaro; and Eto, Tooru, 4,885,639, Cl. 358-167.000.

Sato, Kenji: *See*—
Fukushima, Takeo; Mizuguchi, Masami; Furukawa, Takahiro; Yato, Yoshiaki; Sato, Kenji; Fujimoto, Naonobu; and Murase, Tetsuro, 4,885,746, Cl. 370-102.000.

Sato, Masakazu: *See*—
Ban, Keisuke; Sato, Masakazu; Fujito, Bakugo; and Kikuchi, Kousuke, 4,884,621, Cl. 164-4.100.

Sato, Minoru: *See*—
Takagi, Shiro; Sato, Minoru; and Izawa, Koji, 4,885,704, Cl. 364-521.000.

Sato, Ryo: *See*—
Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, 4,885,024, Cl. 71-92.000.

Satoh, Isao: *See*—
Fukushima, Yoshihisa; Satoh, Isao; Ichinose, Makoto; Kuroki, Yuzuru; and Takagi, Yuuji, 4,885,735, Cl. 369-59.000.

Satoh, Masanori: *See*—
Morita, Izuru; Kishitani, Keisuke; Kajitani, Masayoshi; Tozawa, Shoji; Satoh, Masanori; Otabe, Kisaburo; and Onda, Mamoru, 4,884,398, Cl. 60-274.000.

Satoh, Tsumori; and Koichi, Yasushi, to Ricoh Company, Ltd. Cleaning device for an image forming apparatus. 4,885,612, Cl. 355-305.000.

Saunders, Craig M.: *See*—
Kahl, John J., Jr.; Vulpitta, Brian A.; Corbo, Thomas A.; Saunders, Craig M.; and Nottingham, John R., 4,884,734, Cl. 225-26.000.

Saunders, Lionel F.: *See*—
Lavoie, Gerard H.; Miller, Charles W., Jr.; Currier, John K.; Saunders, Lionel F.; and Leary, Daniel J., 4,885,454, Cl. 219-390.000.

Sauter, Frederick J.: *See*—
Gunther, Wolfgang H. H.; and Sauter, Frederick J., 4,885,366, Cl. 544-300.000.

Savard, Donald D., to Interprovincial Pipe Line Company. Method of controlling hardness of pipe weld-joints by radially inserting insulating rings prior to tempering heat-treatment. 4,885,044, Cl. 148-127.000.

Sawada, Noriyasu: *See*—
Sumi, Sigeo; Hamamura, Fumio; Fukuda, Ichio; Seki, Mitsuhiro; and Sawada, Noriyasu, 4,885,048, Cl. 156-552.000.

Sawahata, Kazuo; and Kanamaru, Hisanobu, to Hitachi, Ltd. Method of producing helical internal gear. 4,884,427, Cl. 72-82.000.

Sawamoto, Hideo: *See*—
Umeno, Hidenori; Kubo, Takashige; Hagiwara, Nobutaka; Sato, Hiroaki; and Sawamoto, Hideo, 4,885,681, Cl. 364-200.000.

Sawayama, Noboru: *See*—
Enoki, Shigekazu; Sawayama, Noboru; Katoh, Shunji; and Kimura, Noriyuki, 4,885,223, Cl. 430-122.000.

Sawicki, Wolfgang H.; Svensson, Tomas L.; Weck, Bernd K.; and Meier-Dornberg, Karl E., to Sandvik AB. Force sensor. 4,884,461, Cl. 73-862.060.

Sbaschnigg, Johann, to Maschinenfabrik Andritz Actiengesellschaft. Filter belt press. 4,885,088, Cl. 210-400.000.

Scapecchi, Pier L.: *See*—
Ciccarone, Angelo; Oldani, Emilio; and Scapecchi, Pier L., 4,884,539, Cl. 123-310.000.

Schafer, Dankmar: *See*—
Funk, Hans G.; Neumann, Frank; and Schafer, Dankmar, 4,884,829, Cl. 285-24.000.

Schatz, Oskar. Valve arrangement for a piston charger driven by exhaust gas pulses. 4,884,405, Cl. 60-605.100.

Schaub, Georg: *See*—
Karbach, Alfred; Schaub, Georg; and Peters, Rolf, 4,884,408, Cl. 60-667.000.

Schauder, Colin D., to Westinghouse Electric Corp. Induction motor torque/flux control system. 4,885,518, Cl. 318-798.000.

Scheibli, Peter, to Ciba-Geigy Corporation. Reactive dyes containing a sulfonyl and an aliphatic acyl reactive radical. 4,885,360, Cl. 534-642.000.

Scheit, Arnold; and Bruderle, Ernst, to Messerschmitt-Bolkow-Blohm GmbH. Method for calibrating the gyros of a 3-axis stabilized satellite. 4,884,771, Cl. 244-165.000.

Scheiwiller, Rolf. Structural assembly for producing walls. 4,884,378, Cl. 52-169.400.

Scherer, Michael J., to American Recreation Products, Inc. Sleeping bag. 4,884,303, Cl. 5-413.000.

Schering Aktiengesellschaft: *See*—
Hofmeister, Helmut; Laurent, Henry; and Wiechert, Rudolf, 4,885,117, Cl. 260-397.450.

Schering Corporation: *See*—
Andrews, David R.; Gaeta, Federico C. A.; and Watkins, Robert W., 4,885,293, Cl. 514-223.200.

Schier, J. A. Position determining apparatus. 4,885,433, Cl. 178-19.000.

Schimmel, Johannes; Bauer, Harald; Burian, Gunther; Hulla, Heinz; Kagerer, Robert; and Kubin, Helmut, to Steyr-Daimler-Puch AG. System for optimizing driving parameters in utility vehicles. 4,885,690, Cl. 364-424.100.

Schirmer, Henry G.: *See*—
Mueller, Walter B.; and Schirmer, Henry G., 4,885,119, Cl. 264-22.000.

Schlage Lock Company: *See*—
Smallegan, Jon M.; and Bettger, Richard R., 4,884,835, Cl. 292-357.000.

Schleusener, Eckart: *See*—
Danner, Bernard; and Schleusener, Eckart, 4,885,325, Cl. 524-236.000.

Schlumberger Systems, Inc.: *See*—
Deering, Michael F., 4,885,703, Cl. 364-522.000.

Schlumberger Technology Corporation: *See*—
Havira, R. Mark; and Seeman, Bronislaw, 4,885,723, Cl. 367-35.000.

Schmale, Gerhard; Gerich, Frank; and Barda, Rudolph C. Continuously variable adjustable hinge. 4,884,845, Cl. 297-367.000.

Schmelzer, Eugene: *See*—
Ferk, Don L.; Schmelzer, Eugene; and Haun, Edward C., 4,885,424, Cl. 585-450.000.

Schmidt, Donald L.: *See*—
Wessling, Ritchie A.; Schmidt, Donald L.; and Aikawa, Kiyoshi I., 4,885,355, Cl. 528-99.000.

Schmidt, La Vern. Screw auger chemical applicator. 4,884,724, Cl. 222-623.000.

Schmidt, Raymond H. Tire changing machine. 4,884,611, Cl. 157-1.240.

Schmidt, Reinhard, to Hergeth Hollingsworth, GmbH. Apparatus for arresting the rotary tower of a bale opening device. 4,884,319, Cl. 19-80.00R.

Schmitt, Manfred; and Hanke, Wolfgang, to J. M. Voith GmbH. Elastic coupling with spring guides. 4,884,996, Cl. 464-68.000.

Schmitt, Michael L.: *See*—
Hoover, Mervyn C.; and Schmitt, Michael L., 4,885,586, Cl. 342-13.000.

Schmuckler, Gabriella, to Technion Research and Development Foundation Ltd. Method for the interseparation of platinum group metals. 4,885,143, Cl. 423-22.000.

Schnarch, Benjamin, to Israel Aircraft Industries Ltd. Apparatus for positioning optical elements. 4,884,882, Cl. 350-634.000.

Schnebly, John; and Marusak, Thomas J., to Comfortex Corporation. Pleated blind with articulative slat extensions. 4,884,612, Cl. 160-84.100.

Schnebly, John T., to Thermocell, Ltd. Method for producing expandable honeycomb material. 4,885,190, Cl. 427-207.100.

Schneider, Ewald: *See*—
Annighofer, Frank; Schneider, Ewald; and Schultze, Hans-Joachim, 4,885,331, Cl. 524-539.000.

Schneider, Hans-Peter: *See*—
Mayer, Kurt; Richey, Volker; and Schneider, Hans-Peter, 4,885,530, Cl. 324-61.00R.

Schneider, Kurt: *See*—
Hoelderich, Wolfgang; Schneider, Kurt; and Hupfer, Leopold, 4,885,395, Cl. 568-314.000.

Schneider, William R., to Battelle Memorial Institute. Coaxial screen filter. 4,885,009, Cl. 55-96.000.

Schnell, Josef. Load applying driving apparatus for an exercise device. 4,884,801, Cl. 272-117.000.

Schnittker, William E., to Hubbell Incorporated. Metal clad cable connector. 4,885,429, Cl. 174-65.0SS.

Schoeller, Christoph: *See*—
Schoeller, Martin; and Schoeller, Christoph, 4,884,712, Cl. 220-21.000.

Schoeller, Martin; and Schoeller, Christoph. Stackable bottle case. 4,884,712, Cl. 220-21.000.

Schoenberger, Rainer, to Linde Aktiengesellschaft. Method for purification of phosphate-containing sewage. 4,885,093, Cl. 210-605.000.

Schoeps, Knut C., to Atlas Copco Aktiebolag. Hydraulic torque impulse generator. 4,884,995, Cl. 464-25.000.

Scholl, Frederick W.: *See*—
Helbers, Jan; Scholl, Frederick W.; and Coden, Michael H., 4,885,743, Cl. 370-85.200.

Scholl, Gerhard: *See*—
Jorzyk, Sigurd; Scholl, Gerhard; Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; and Dewert, Heribert, 4,885,011, Cl. 55-242.000.

Scholl, Karl: *See*—
Lange, Ernst W.; Scholl, Karl; and Vespermann, Dieter, 4,884,708, Cl. 220-3.000.

Schrimpf, Ronald D.: *See*—
Warner, Raymond M., Jr.; Schrimpf, Ronald D.; and Tuszynski, Alfons, 4,885,615, Cl. 357-22.000.

Schroepfer, Daniel A.: *See*—
Kofol, J. Stephen; and Schroepfer, Daniel A., 4,885,592, Cl. 343-754.000.

Schroth, Hans-Joachim: *See*—
Oberhausen, Erich; Kuhlmann, Ludwig; Seibert, Gerhard; Steinstrasser, Axel; Schroth, Hans-Joachim; and Bremer, Karl-Heinz, 4,885,151, Cl. 424-1.100.

Schubert, Peter J.; and Wallace, Robert J., to General Motors Corporation. Insulated gate FET having a buried insulating barrier. 4,885,618, Cl. 357-23.110.

Schubert, Rainer H.: *See*—
Reinhardt, Erich; and Schubert, Rainer H., 4,885,014, Cl. 55-484.000.

Schultz, Jean-Pierre; and Verna, Eric, to l'Air Liquide, Societe Anonyme Pour l'Etude Et l'Exploitation des Procedes Georges Claude. Process for terminating closed through-hole plasma arc welding. 4,885,455, Cl. 219-121.460.

Schultze, Hans-Joachim: *See*—
Annighofer, Frank; Schneider, Ewald; and Schultze, Hans-Joachim, 4,885,331, Cl. 524-539.000.

Schulz, David W.: *See*—
Farrow, John F.; and Schulz, David W., 4,885,451, Cl. 219-110.000.

Schulze, Dieter, to Parker-Ermeto GmbH. Fluid pressure measuring device with pressure attenuation. 4,884,451, Cl. 73-706.000.

Schumacher'sche Fabrik GmbH & Co. KG: *See*—
Reinhardt, Erich; and Schubert, Rainer H., 4,885,014, Cl. 55-484.000.

Schwaiger, Gunther: *See*—
Springer, Hartmut; Helmling, Walter; and Schwaiger, Gunther, 4,885,385, Cl. 562-430.000.

Schwartzman, Everett H. Resiliently mounted fluid bearing assembly. 4,884,899, Cl. 384-100.000.

Schwarz, Manfred: *See*—
Konrath, Karl; Koester, Claus; Zibold, Karl; Schwarz, Manfred; Russeler, Karl-Friedrich; Krieger, Klaus; and Kupzik, Roland, 4,884,542, Cl. 123-370.000.

Schwarz, Walter. Device for spiral winding of tapes. 4,884,426, Cl. 72-50.000.

Schwarzbacker, Werner, to Convotherm Elektrogerate GmbH. Device for heat-treating food items. 4,884,553, Cl. 126-20.000.

Schweighardt, Frank K.; Bailey, Webb I.; Lileck, John T.; Graybill, John K.; and Lutz, Eugene G. Perfluorinated propyl derivative compounds. 4,885,414, Cl. 570-130.000.

Schweinsberg, Dieter K. J., to Datox Organisation D. Schweinsberg GmbH & Co. KG. Microfilm aperture card, in particular camera card. 4,884,885, Cl. 353-120.000.

Schwenner, Eckhard: *See*—
Meyer, Horst; Schwenner, Eckhard; and Knorr, Andreas, 4,885,303, Cl. 514-332.000.

Scientific-Atlanta, Inc.: *See*—
Hess, Doren W., Jr.; and Jones, John R., 4,885,593, Cl. 343-786.000.
Lucas, Keith, 4,885,775, Cl. 380-10.000.

SCM Metal Products, Inc.: *See*—
Buerkle, Thomas B.; and Troxell, Jack D., 4,885,029, Cl. 75-235.000.

Scott, Andrew: *See*—
Paffhausen, Hans; Hogarth, Ian; Scott, Andrew; and Mackintosh, Christine, 4,884,908, Cl. 400-241.200.

Scott, Dennis J.: *See*—
Hill, Robert A.; and Scott, Dennis J., 4,885,497, Cl. 310-265.000.

Seagate Technology, Inc.: *See*—
Pennock, John L., 4,885,517, Cl. 318-678.000.

Sebag, Henri, to L'Oreal. Process for preparing nonionic surfactants from glycerol monochlorohydrin, in an aromatic solvent medium, products obtained and compositions containing them. 4,885,402, Cl. 568-620.000.

Seeman, Bronislaw: *See*—
Havira, R. Mark; and Seeman, Bronislaw, 4,885,723, Cl. 367-35.000.

Seibert, Gerhard: *See*—
Oberhausen, Erich; Kuhlmann, Ludwig; Seibert, Gerhard; Steinstrasser, Axel; Schroth, Hans-Joachim; and Bremer, Karl-Heinz, 4,885,151, Cl. 424-1.100.

Seidel, Helmut, to Messerschmitt-Bolkow-Blohm GmbH. Frequency-selective sound transducer. 4,885,781, Cl. 381-159.000.

Seidel, Peter: *See*—
Pelzl, Leo; Seidel, Peter; and Zell, Karl, 4,884,975, Cl. 439-78.000.

Seidel, William C.: *See*—
Cochran, Stuart A.; Benjamin, Earl J.; Crocker, Mary E.; Seidel, William C.; and Cipriano, Vicki L., 4,885,180, Cl. 426-241.000.

Seiko Epson Corporation: *See*—
Miyazawa, Osamu, 4,885,730, Cl. 368-157.000.

Seiko Instruments Inc.: *See*—
Ohta, Masahiko, 4,885,616, Cl. 357-23.700.
Yamamoto, Hiroyoshi; Takesue, Toshiharu; and Kawawada, Naoki, 4,884,859, Cl. 350-96.150.

Seismograph Service (England) Limited: *See*—
Auger, David; and Breugelmans, Jacobus, 4,885,727, Cl. 367-146.000.

Seitz, Edwin, to Hohe KG. Exterior mirror for a vehicle. 4,884,776, Cl. 248-481.000.

Seki, Mitsuhiro: *See*—
Sumi, Sigeo; Hamamura, Fumio; Fukuda, Ichio; Seki, Mitsuhiro; and Sawada, Noriyasu, 4,885,048, Cl. 156-552.000.

Seki, Takahito: *See*—
Kanota, Keiji; and Seki, Takahito, 4,885,646, Cl. 360-46.000.

Seki, Tomoaki: *See*—
Takao, Hiroyoshi; Imai, Akio; and Seki, Tomoaki, 4,885,338, Cl. 525-77.000.

Sekiuchi, Kazuto: *See*—
Yoshikawa, Kensei; Ohuchi, Yutaka; Sekiuchi, Kazuto; Saito, Shiuji; Hatayama, Katsuo; and Sota, Kaoru, 4,885,367, Cl. 546-216.000.

Selby, Steven F.: *See*—
Klein, Frank H.; Selby, Steven F.; and Klueger, Sigmund, 4,884,870, Cl. 350-319.000.
Klein, Frank H.; Selby, Steven F.; and Klueger, Sigmund, 4,884,872, Cl. 350-321.000.

Selden, Boynton. Gooseneck lamp and magnifier with improved clamp assembly. 4,885,667, Cl. 362-253.000.

Sellers, William; and Garrison, Terry. Compressor slugging protection device and method therefor. 4,884,412, Cl. 62-115.000.

Senba, Tetsuo, to Sony Corp. Method and apparatus for digitally recording and reproducing a color video signal for a SECAM system. 4,885,642, Cl. 358-310.000.

Senfter, Emil, to Steyr-Daimler Puch AG. Sports pistol. 4,884,354, Cl. 42-73.000.

Sengewald, Karl-Heinz. Gas-sterilizable package, cover of and arrangement for producing the same. 4,884,694, Cl. 206-484.100.

Sengoku, Koji; and Tomita, Misao, to House Food Industrial Company Limited; and Takai Tofu & Soymiik Equipment Co. Continuous digesting apparatus. 4,884,498, Cl. 99-352.000.

Sensoptic Development B.V.: *See*—
Borsboom, Petrus C. F., 4,884,891, Cl. 356-446.000.

Sessions, Robert W., to Ferris Mfg. Corp. Non-stretching wound dressing and method for making same. 4,884,563, Cl. 128-155.000.

Setele, Richard A., to Home Fashions, Inc. Vertical blind louver having transparent grooved side edges. 4,884,616, Cl. 160-236.000.

Seto, Kiyotomo; Tanaka, Sakuya; and Sakoda, Ryozo, to Nissan Chemical Industries Ltd. Dihydropyridine-5-phosphonic acid cyclic propylene ester. 4,885,284, Cl. 514-89.000.

Sevrin, Mireille: *See*—
George, Pascal; Sevrin, Mireille; and Maloizel, Christian, 4,885,302, Cl. 514-307.000.

Sewell, Mark S. Ski base flattener. 4,884,343, Cl. 30-169.000.

Seyfried, Ulrich: *See*—
Hoffmann, Horst; Kersten, Peter; Volz, Hans; and Seyfried, Ulrich, 4,884,453, Cl. 73-776.000.

Sgrignoli, Gary J., to Zenith Electronics Corporation. Method and apparatus for protection of channel access in broadband cable communications systems. 4,885,794, Cl. 455-5.000.

SGS-Thomson Microelectronics S.A.: *See*—
Philippe, Maige, 4,885,673, Cl. 363-21.000.

Shaar, Carl J.; and Smith, Michele C., to Eli Lilly and Company. Topical use of IGF-II for wound healing. 4,885,163, Cl. 514-2.000.

Shaffer, Gregory W., to Union Carbide Corporation. Boron nitride containing vessel having a surface coating of titanium iron-silicon thereon. 4,884,788, Cl. 266-275.000.

Shafir, Aharon. Method and apparatus for making shoe lasts and/or shoe components. 4,884,309, Cl. 12-1.00R.

Shander, Douglas: *See*—
Breuer, Miklos M.; Kaszynski, Edwin G.; Shander, Douglas; Usdin, Vera R.; and van der Lee, Hermes, 4,885,289, Cl. 514-170.000.

Shandong Aluminum Works: *See*—
Guangchun, Yao; Zhuxian, Qiu; and Wu, Nu Z., 4,885,073, Cl. 204-291.000.

Sharp, David P.; Lee, Charles H.; and Cassidy, Thomas, to Compaq Computer Corporation. Multiple computer interface circuit board. 4,885,482, Cl. 307-465.000.

Sharp Kabushiki Kaisha: *See*—
Yasuoka, Norio; Kobayashi, Takehiro; Hikida, Nobuharu; Hatakeyama, Yasuyuki; Aoto, Yoshiyuki; and Itogawa, Jiro, 4,885,766, Cl. 379-105.000.
Yoshiura, Shoichiro, 4,885,640, Cl. 358-400.000.

Shatas, Remigius G.: *See*—
Asprey, Robert R.; and Shatas, Remigius G., 4,885,718, Cl. 364-900.000.

Shaw, Howard H.: *See*—
Kopatz, Nelson E.; Johnson, Walter A.; Vanderpool, Jack E.; and Shaw, Howard H., 4,885,028, Cl. 75-0.5BB.

Shaw, Richard J., to Better Health Concepts Co Inc. Apparatus for manufacture of end brush. 4,884,849, Cl. 300-4.000.

Shea, Dennis G.: *See*—
Perry, Kenneth J.; Thefaine, Yannick J.; Hailpern, Brent T.; Hoevel, Lee W.; and Shea, Dennis G., 4,885,578, Cl. 340-825.520.

Sheesley, Wilmer L.: *See*—
Fleming, David F.; Kerlin, Harold W.; Pauza, William V.; and Sheesley, Wilmer L., 4,884,982, Cl. 439-620.000.

Sheff, Sumner: *See*—
Hall, James B.; and Sheff, Sumner, 4,885,056, Cl. 156-662.000.

Sheffield, James, to Izon Industries Inc. Multiple sprew bar stack mold. 4,884,962, Cl. 425-234.000.

Shekhawat, Sampat S.; Dhyanchand, John J.; and Horowy, John, to Sundstrand Corp. Darlington amplifier with high speed turnoff. 4,885,486, Cl. 307-570.000.

Shell Oil Company: *See*—
Danforth, Richard L.; and Smith, Darlene G., 4,885,318, Cl. 524-281.000.
Danforth, Richard L.; and Smith, Darlene G., 4,885,328, Cl. 525-424.000.
Vinegar, Harold J.; Wellington, Scott L.; and de Waal, Jannetje A., 4,884,455, Cl. 73-798.000.
Wang, Pen C., 4,885,351, Cl. 526-262.000.

Shelley, David L.: *See*—
Loftus, Daniel L.; and Shelley, David L., 4,885,796, Cl. 455-11.000.

Shepherd, Roger M.: *See*—
Parson, Brian J.; Shepherd, Roger M.; May, Michael D.; and Stewart, Graham, 4,885,740, Cl. 370-60.000.

Sheppard, William L., to Cable Manufacturing and Assembly Company, Inc. Control cable. 4,884,544, Cl. 123-400.000.

Sherrington, David C.: *See*—
Affrossman, Stanley; Bakhshaee, Massoud; Pethrick, Richard A.; and Sherrington, David C., 4,885,344, Cl. 525-302.000.

Shiba, Haruo; Okamura, Masatoshi; and Hashizume, Kenji, to TDK Corporation. Tape cassette with low friction slide member for guiding movement of a lid thereon. 4,885,651, Cl. 360-132.000.

Shiba, Kunio: *See*—
Nakatsuka, Iwao; Okuno, Masami; Shiba, Kunio; and Yoshitake, Akira, 4,885,152, Cl. 424-1.100.

Shibagaki, Masami, to Anelva Corporation. Etching method. 4,885,054, Cl. 156-643.000.

Shibata, Isao, to Nippon Seimitsu Kogyo Kabushiki Kaisha. Camera having data recording function. 4,885,598, Cl. 354-106.000.

Shibata, Morio: *See*—
Nakakura, Hirofumi; Shibata, Morio; Ishikawa, Haruo; Nakano, Akihisa; Hiroto, Hiromi; and Oyabu, Hajime, 4,885,176, Cl. 426-19.000.

Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Tobita, Etsuo, 4,885,323, Cl. 524-95.000.

Shibata, Yoji, to Jamco Corporation. Lavatory module for a passenger airplane. 4,884,767, Cl. 244-118.500.

Shigeta, Katsuyoshi: *See*—
Kannagi, Reiji; Shigeta, Katsuyoshi; Ito, Yukishige; Kirihata, Yoshiko; and Ogawa, Tomoya, 4,885,358, Cl. 530-387.000.

Shikakura, Akihiro; Takahashi, Koji; Takei, Masahiro; and Sasatani, Tomohiko, to Canon Kabushiki Kaisha. Encoder. 4,885,637, Cl. 358-133.000.

Shimada, Fumiyo: *See*—
Umemoto, Isao; Shimada, Fumiyo; and Mitsuno, Yuichiro, 4,885,109, Cl. 252-174.210.

Shimada, Toshikazu: *See*—
Furukawa, Seijiro; Etoh, Hiroyuki; Ishizaka, Akitoshi; and Shimada, Toshikazu, 4,885,614, Cl. 357-16.000.

Shimano Industrial Company Limited: *See*—
Yasui, Toshihiko, 4,884,356, Cl. 43-23.000.

Shimazu, Hideaki: *See*—
Watanabe, Yasuo; Yamakoshi, Kenichi; and Shimazu, Hideaki, 4,885,002, Cl. 604-9.000.

Shimizu, Hiromitsu, to Hirose Manufacturing Company, Limited. Loop taker and sewing machine. 4,884,520, Cl. 112-231.000.

Shimizu, Isamu: *See*—
Ishihara, Shunichi; Ootoshi, Hirokazu; Hirooka, Masaaki; Hanna, Junichi; and Shimizu, Isamu, 4,885,258, Cl. 437-40.000.

Shimizu, Isao: *See*—
Nagai, Yasuo; Shimizu, Isao; Kimura, Masatoshi; Kaneko, Kenji; Okabe, Takeaki; and Sakamoto, Koozoo, 4,885,628, Cl. 357-68.000.

Shimizu, Isoo; Matsumura, Yasuo; and Inomata, Yoshihisa, to Nippon Petrochemicals Company, Ltd. 1,2-Di(4-isobutylphenyl)hydrocarbon and its preparation and uses as intermediate. 4,885,419, Cl. 585-25.000.

Shimizu, Kazuo: *See*—
Yamamura, Masaaki; Inokoshi, Junichi; Ito, Tetuo; Furuta, Kazumitsu; and Shimizu, Kazuo, 4,885,102, Cl. 252-8.800.

Shimizu, Tadashi: *See*—
Szu, Tseng; and Shimizu, Tadashi, 4,884,586, Cl. 135-26.000.

Shimura, Kazuo, to Fuji Photo Film Co., Ltd. Radiation image recording apparatus, and stimulable phosphor sheet feeding and loading apparatus. 4,885,468, Cl. 250-327.200.

Shin Caterpillar Mitsubishi Ltd.: *See*—
Morita, Izuru; Kishitani, Keisuke; Kajitani, Masayoshi; Tozawa, Shoji; Satoh, Masanori; Otabe, Kisaburo; and Onda, Mamoru, 4,884,398, Cl. 60-274.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Amano, Tadashi; and Abe, Tokuji, 4,885,333, Cl. 524-762.000.

Shinohara, Masayori: *See*—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,885,644, Cl. 358-342.000.

Shinozaki, Fumihiko: *See*—
Yokoyama, Yutaka; and Shinozaki, Fumihiko, 4,885,115, Cl. 252-62.200.

Shiragai, Yasuo: *See*—
Tutamune, Hirotaka; Shiragai, Yasuo; Karino, Yoshiaki; and Wakasa, Yasuyuki, 4,884,698, Cl. 209-534.000.

Shirahata, Ryuji: *See*—
Yasunaga, Tadashi; and Shirahata, Ryuji, 4,885,189, Cl. 427-129.000.

Shiraishi, Takayoshi: *See*—
Takaragi, Kazuo; Sasaki, Ryoichi; Shiraishi, Takayoshi; and Kurashiki, Nobuhiro, 4,885,777, Cl. 380-30.000.
Takaragi, Kazuo; Shiraishi, Takayoshi; and Sasaki, Ryoichi, 4,885,788, Cl. 380-23.000.

Shirakawa, Masakazu, to Kabushiki Kaisha Toshiba. Telephone system with stimulus operation or default operation. 4,885,765, Cl. 379-93.000.

Shirose, Meizo: *See*—
Kaneko, Tadashi; Shirose, Meizo; and Yamamoto, Yoko, 4,885,222, Cl. 430-102.000.

Shizuoka Seiki Co., Ltd.: *See*—
Kuwabara, Youhei; and Asaoka, Teruo, 4,885,066, Cl. 204-129.430.

Shockey, Brent J.; and Tompkins, Rodney R., to Heritage Industries, Inc. Automatic teller machine housing. 4,884,514, Cl. 109-24.100.

Shockley, James F.: *See*—
Kane, Mark E.; Shockley, James F.; and Eck, Henry H., 4,885,689, Cl. 364-424.010.

Shofner Engineering Associates, Inc.: *See*—
Shofner, Frederick M.; Miller, Arthur C., Jr.; and Kreikebaum, Gerhard, 4,885,473, Cl. 250-574.000.

Shofner, Frederick M.; Miller, Arthur C., Jr.; and Kreikebaum, Gerhard, to Shofner Engineering Associates, Inc. Method and apparatus for detecting particles in a fluid using a scanning beam. 4,885,473, Cl. 250-574.000.

Shriver, David L.: *See*—
Kinser, Ralph W., Jr.; Shriver, David L.; and Layman, Judith A., 4,885,430, Cl. 174-254.000.

Shrode, John. Vehicle hood supported frameless foldable protective emergency shelter. 4,884,588, Cl. 135-88.000.

Shultz, William E. Adjustable and lockable screw spindle support device. 4,884,914, Cl. 403-118.000.

Sibley, Paul T., to Coleman Outdoor Products, Inc. Backpack with detachable auxiliary packs. 4,884,731, Cl. 224-215.000.

Siecor Corporation: *See*—
Throckmorton, Rodney A., 4,884,863, Cl. 350-96.200.

Siemens Aktiengesellschaft: *See*—
Hoffmann, Kurt; Oberle, Hans-Dieter; Kraus, Rainer; Kowarik, Oskar; and Paul, Manfred, 4,885,748, Cl. 371-21.300.
Kleine, Peter; and Wechsler, Klaus, 4,884,710, Cl. 220-4.00R.
Mazure-Espejo, C. A.; and Neppl, Franz, 4,885,617, Cl. 357-23.900.
Pelzl, Leo; Seidel, Peter; and Zell, Karl, 4,884,975, Cl. 439-78.000.
Vogelmann, Heinrich-Karl, 4,885,519, Cl. 318-800.000.

Siemens-Bendix Automotive Electronics L.P.: *See*—
Hensley, Thomas E.; and Slack, Gary L., 4,884,782, Cl. 251-129.150.
Lee, Ki W.; and Cook Jr., Charles R., 4,884,443, Cl. 73-204.160.

Siemens- Pacesetter, Inc.: *See*—
Elliott, Clyde D.; and Cohen, Donald M., 4,884,567, Cl. 128-303.00R.
Long, Ronald J., 4,884,345, Cl. 33-1.00C.

Sikorski, Siegfried, to MTU Motoren-und Turbinen Union Munchen GmbH. Deflectable blade assembly for a prop-jet engine and associated method. 4,884,948, Cl. 416-132.00R.

Silas, Cynthia L. Baby feeding bib. 4,884,298, Cl. 2-49.00R.

Sillars, Ian. Method for printing of quasi random number tables on cylindrical objects. 4,884,504, Cl. 101-483.000.

Simcoe, Steven B.; Orth, Charles M.; and VanDaele, John J., to Tokheim Corporation. Sealed backlit switch assembly. 4,885,443, Cl. 200-296.000.

Simpson, David H., to Klein Tools Inc. Cover for collapsible shelter. 4,884,589, Cl. 135-117.000.

Simpson, Ted. Device for holding the mouth of a flexible bag open and method of use. 4,884,603, Cl. 141-390.000.

Sindlhauser, Peter; Hunold, Klaus; and Lipp, Alfred, to Elektroschmelzwerk Kempten GmbH. Pressure-sintered polycpystalline mixed materials with a base of hexagonal boron nitride, oxides and carbides. 4,885,264, Cl. 501-87.000.

Singh, Prabhakar: *See*—
Spengler, Charles J.; and Singh, Prabhakar, 4,885,078, Cl. 204-432.000.

Sinox Company, Ltd.: *See*—
Ling, Chong-Kuan, 4,884,419, Cl. 70-4.000.

Sippel, Achim: *See*—
Kruse, Heinz-Josef; Karius, Klaus D.; and Sippel, Achim, 4,884,508, Cl. 102-524.000.

Sisk, Hollis D., to Century Electric, Inc. Multi-piece amortisseur winding end plate. 4,885,495, Cl. 310-216.000.

Sivahop, Albert: *See*—
Novis, Ari M.; Adams, Don L.; LaMontagne, Troy J.; and Sivahop, Albert, 4,885,514, Cl. 318-580.000.

Skatrud, Paul L.: *See*—
Ingolia, Thomas D.; Queener, Stephen W.; Samson, Suellen M.; Skatrud, Paul L.; and Godfrey, Otis W., 4,885,251, Cl. 435-183.000.
Ingolia, Thomas D.; Queener, Stephen W.; Skatrud, Paul L.; and Wiegel, Barbara J., 4,885,252, Cl. 435-252.300.

SKF GmbH: *See*—
Harsdorff, Ortwin, 4,884,901, Cl. 384-448.000.
Kispert, Klaus; and Stolz, Robert, 4,884,902, Cl. 384-550.000.

Skirvin, Marc A. Self-contained disposable animal commode. 4,884,527, Cl. 119-1.000.

Skurkovich, Simon. Production of anti-viral and anti-bacterial agents in combination. 4,885,165, Cl. 424-85.400.

Slack, Gary L.: *See*—
Hensley, Thomas E.; and Slack, Gary L., 4,884,782, Cl. 251-129.150.

Slack, William E., to Mobay Corporation. Liquid isocyanate prepolymers. 4,885,353, Cl. 528-68.000.

Slagsvol, Elizabeth A. Tracing paper having a removable margin of pressure sensitive adhesive. 4,884,826, Cl. 281-2.000.

Slater, Frank W. Combined air foil and loading ramp for pickup truck. 4,884,838, Cl. 296-180.100.

Slifkin, Malcolm, to Himmelrich and Company. Method of crystallization of honey. 4,885,035, Cl. 127-58.000.

Slosky, Jack J.: *See*—
Iqbal, Tahir; Cain, John H., Jr.; and Slosky, Jack J., 4,885,100, Cl. 252-1.000.

SLT North America Inc.: *See*—
Brandt, Michael, 4,885,201, Cl. 428-143.000.

Sluyterman, Albertus A. S.; and Vink, Nicolaas G., to U.S. Philips Corporation. Deflection unit for use in a projection television display tube. 4,885,502, Cl. 313-431.000.

Smallegan, Jon M.; and Bettger, Richard R., to Schlage Lock Company. Lever spindle spring cage. 4,884,835, Cl. 292-357.000.

Smeltz, Kenneth C.: *See*—
Putzig, Donald E.; and Smeltz, Kenneth C., 4,885,103, Cl. 252-8.551.

Smith, Charles R.; Brindisi, Anthony E.; and Tyree, Gerald W., to Lockheed Corporation. Flush head fastener. 4,884,929, Cl. 411-3.000.

Smith, Darlene G.: *See*—
Danforth, Richard L.; and Smith, Darlene G., 4,885,318, Cl. 524-281.000.
Danforth, Richard L.; and Smith, Darlene G., 4,885,328, Cl. 525-424.000.

Smith, Garry D. F.; and Manderson, William, to Xerox Canada, Inc.; and Associated Management Group. Collapsible transporter module and method of using same. 4,884,935, Cl. 414-498.000.

Smith, Gerald A.: *See*—
Sadoff, Armin M.; Nelson, Richard C.; Smith, Gerald A.; Johnstonbaugh, Joseph; and Sadoff, Stevn J., 4,884,445, Cl. 73-379.000.

Smith, James A.: *See*—
Henze, Christopher P.; and Smith, James A., 4,885,675, Cl. 363-26.000.

Smith, Kenneth H.: *See*—
Hallam, Keith J.; and Smith, Kenneth H., 4,884,511, Cl. 105-247.000.

Smith Kline & French Laboratories Limited: *See*—
Coates, William J., 4,885,301, Cl. 514-263.000.

Smith, Louise; and Kautman, Frank W. Nail polish remover wand containing disposable pads. 4,884,913, Cl. 401-196.000.

Smith, Michele C.: *See*—
Shaar, Carl J.; and Smith, Michele C., 4,885,163, Cl. 514-2.000.

Smith, Moira A.: *See*—
Thornley, David J.; Smith, Moira A.; Dale, Philip; Leask, Samuel H.; and Coutts, Ian M., 4,884,368, Cl. 49-276.000.

Smith, Normand C., to International Business Machines Corporation. Print head incorporating one piece armature with intermediate clamping pads. 4,884,905, Cl. 400-124.000.

Smith, Peter J., to Fomico International, Inc. Retaining wall module having face panel and T-stem with means for receiving transverse stabilizing web. 4,884,921, Cl. 405-286.000.

Smith, Redd H.; and Cooley, Craig H., to Eastman Christensen Company. Rotary drill bit with abrasion and erosion resistant facing. 4,884,477, Cl. 76-108.00A.

Smith, Richard P.; Udseth, Harold R.; and Olivares, Jose A., to Battelle Memorial Institute. Combined electrophoresis-electrospray interface and method. 4,885,076, Cl. 204-299.00R.

Smith, Robert A.: *See—*
Fry, John J.; Hall, George, II; and Smith, Robert A., 4,885,573, Cl. 340-519.000.

Smith, Robert E., to National Coupling Company, Inc. Internally preloaded metal-to-metal seal hydraulic connector. 4,884,584, Cl. 137-614.040.

Smith, William C., to United States of America, National Aeronautics and Space Administration. Electrostatic discharge test apparatus. 4,885,543, Cl. 324-452.000.

Snead, Edwin de S., to Davis Aerospace Corp. Aerial recovery parachute system. 4,884,769, Cl. 244-145.000.

Snoddy, Michael L.; and Mount, Houston B., II, to Amoco Corporation. Automated nuclear magnetic resonance analysis. 4,885,540, Cl. 324-318.000.

Sobczak, Zbigniew P.: *See—*
Ting, Chiu H.; Rucker, Thomas G.; and Sobczak, Zbigniew P., 4,885,262, Cl. 437-231.000.

Societe Anonyme dite: Alcatel Espace: *See—*
Fontanes, Sylvain; Birot, Patrice; Marguinaud, Andre ; Quignon, Thierry; and Romann, Brigitte, 4,885,756, Cl. 375-82.000.

Societe de Prospection et d'Invention Techniques, S. A.: *See—*
Revol, Gerard; Roillet, Maxime; and Barthomeuf, Jean-Paul, 4,884,931, Cl. 411-57.000.

Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A." : *See—*
Pham, Lucien; and Taillani, Jean-Claude C., 4,884,903, Cl. 384-563.000.

Soft Sheen Products, Inc.: *See—*
Williams, Barry W.; and Daniels, Pamela M., 4,885,160, Cl. 424-72.000.

Sofy, Hugh M. Tree stand. 4,884,363, Cl. 47-40.500.

Sogabe, Satoshi: *See—*
Minohara, Kiyomi; Sogabe, Satoshi; and Suzuki, Shinichiro, 4,884,522, Cl. 114-125.000.

Sogawa, Yoshiyuki, to Fuji Jukogyo Kabushiki Kaisha. Fuel injection control system for an automotive engine. 4,884,546, Cl. 123-486.000.

Sogawa, Yoshiyuki, to Fuji Jukogyo Kabushiki Kaisha. Fuel injection control system for an automotive engine. 4,884,548, Cl. 123-492.000.

Sokolkin, Boris P.: *See—*
Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

Soloviev, Sergei A.: *See—*
Fedorov, Svyatoslav N.; Soloviev, Sergei A.; Degtev, Evgeny I.; Ivashina, Albina I.; and Karavaev, Alexandr A., 4,884,569, Cl. 128-305.000.

Solvay & Cie. (Societe Anonyme): *See—*
Vedove, Walter D., 4,885,210, Cl. 428-447.000.

Somar Corporation: *See—*
Sumi, Sigeo; Hamamura, Fumio; Fukuda, Ichio; Seki, Mitsuhiro; and Sawada, Noriyasu, 4,885,048, Cl. 156-552.000.

Sonenshine, Daniel; and Hamilton, James G. C., to Center for Innovative Technology. Methods and apparatus for controlling arthropod populations. 4,884,361, Cl. 43-132.100.

Sones, Richard A.; Tesic, Mike M.; and Vidmar, James F., to Picker International, Inc. Gravity actuated X-ray scanner. 4,885,761, Cl. 378-197.000.

Sonoco Products Company: *See—*
Ross, Glenn D., 4,884,740, Cl. 229-120.260.

Sonoi, Takehiro; Sagawa, Toshimasa; Yamada, Okimasa; and Mizuno, Tetsuya, to Nippon Mektron Limited. Process for producing hexafluoroacetone or its hydrate. 4,885,398, Cl. 568-404.000.

Sony Corp.: *See—*
Araki, Shoji, 4,885,546, Cl. 329-341.000.
Kanota, Keiji; and Seki, Takahito, 4,885,646, Cl. 360-46.000.
Leonard, Vurnen J.; and Kuroda, Masayuki, 4,885,652, Cl. 360-133.000.
Nakata, Tetsuro; Sato, Ichitaro; and Eto, Tooru, 4,885,639, Cl. 358-167.000.
Ohba, Akio, 4,885,702, Cl. 364-521.000.
Senba, Tetsuo, 4,885,642, Cl. 358-310.000.
Sugiki, Hiraku; Ino, Hiroyuki; and Fukami, Tadashi, 4,885,647, Cl. 360-73.120.
Yui, Yasuji, 4,885,601, Cl. 355-27.000.

Sota, Kaoru: *See—*
Yoshikawa, Kensei; Ohuchi, Yutaka; Sekiuchi, Kazuto; Saito, Shiuji; Hatayama, Katsuo; and Sota, Kaoru, 4,885,367, Cl. 546-216.000.

Sotoya, Kohshiro; Kubo, Makoto; Okabe, Kazuhiko; Tanigaki, Masanobu; Yamanishi, Masaji; and Hirota, Hajime, to Kao Corporation. Surface active secondary amidoamino acid or salt compounds. 4,885,112, Cl. 252-352.000.

Soucie, William G.; Chen, Wen-Sherng; Witte, Vernon C.; Henry, George A.; and Drehkoff, William D., to Kraft, Inc. Method of making fibrous protein xanthan gum complexes. 4,885,179, Cl. 426-104.000.

Southwest Research Institute: *See—*
McMahon, William A., Jr.; Trujillo, David A.; and Lyle, Robert E., Jr., 4,885,327, Cl. 524-376.000.

Spadafora, Peter J.: *See—*
Hersberger, Jill G.; Bell, Myron H.; Harding, Robert L.; and Spadafora, Peter J., 4,885,710, Cl. 364-565.000.

Spak, Mark A., to Hoechst Celanese Corporation. High temperature post exposure baking treatment for positive photoresist compositions. 4,885,232, Cl. 430-326.000.

Spalding & Evenflo Companies, Inc.: *See—*
Sullivan, Michael J., 4,884,814, Cl. 273-235.00R.

Spann, Mike L.: *See—*
Zowarka, Raymond C.; Weeks, Damon A.; Weldon, William F.; Gully, John H.; Upshaw, Jim L.; Spann, Mike L.; and Peterson, Dennis R., 4,884,489, Cl. 89-8.000.

Sparkomatic Corporation: *See—*
Freadman, Tommyca; and Castagna, John F., 4,884,655, Cl. 181-145.000.

Sparks, Leslie E.; and Plaks, Norman, to United States of America, U.S. Environmental Protection Agency. Combined electrostatic precipitator and acidic gas removal system. 4,885,139, Cl. 422-169.000.

Spater, Stuart S.: *See—*
Kolton, Chester; and Spater, Stuart S., 4,884,726, Cl. 223-91.000.

Specialty Equipment Companies, Inc.: *See—*
Quandt, James A.; and Lee, Joseph M., 4,884,413, Cl. 62-135.000.

Speckenbach, Stephen J., to Hayes Microcomputer Products, Inc. Speed correction and stop bit control circuit for data communications device. 4,885,758, Cl. 375-118.000.

Spector, Donald. Perfume container. 4,884,704, Cl. 215-12.100.

Speidel, Steven W. Method and apparatus for applying liquid chemicals to plants. 4,884,362, Cl. 47-1.500.

Spence, Floyd G.: *See—*
Wemple, James N.; Karrick, Gregory L.; and Spence, Floyd G., 4,885,386, Cl. 562-493.000.

Spencer, James R.; and Mullendore, James A., to GTE Products Corporation. Fine grain tungsten heavy alloys containing additives. 4,885,031, Cl. 75-248.000.

Spengler, Charles J.; and Singh, Prabhakar, to Westinghouse Electric Corp. Devices capable of removing silicon and aluminum from gaseous atmospheres. 4,885,078, Cl. 204-432.000.

Speranza, George P.; Brennan, Michael E.; and Lin, Jiang-Jen, to ARCO Chemical Technology, Inc. Alkoxylated ethylene glycol diamine bottoms products for rigid urethane foams. 4,885,390, Cl. 564-475.000.

Spongh, Rolf T., to Atlas Copco Aktiebolag. Method and apparatus for insulating a spray liquid source from high voltage of an electrostatic spray gun. 4,884,745, Cl. 239-3.000.

Spring Valley Associates, Inc.: *See—*
Springer, Lamar D.; and Springer, Larry D., 4,885,655, Cl. 361-30.000.

Springer, Hartmut; Helmling, Walter; and Schwaiger, Gunther, to Hoechst Aktiengesellschaft. Sulfonyl containing compounds suitable as precurors for water-soluble fiber-reactive triphendioxazine compounds. 4,885,385, Cl. 562-430.000.

Springer, Helmut: *See—*
Weber, Jurgen; Springer, Helmut; and Lappe, Peter, 4,885,383, Cl. 560-103.000.

Springer, Lamar D.; and Springer, Larry D., to Spring Valley Associates, Inc. Water pump protector unit. 4,885,655, Cl. 361-30.000.

Springer, Larry D.: *See—*
Springer, Lamar D.; and Springer, Larry D., 4,885,655, Cl. 361-30.000.

Spurling, Charles A. Safety gate. 4,884,614, Cl. 160-225.000.

Srinivasan, Vadake R.; and Monceaux, Wilbur, to Micro Pure Systems, Inc. Anaerobic digestion process, and forced fed fast rate digester. 4,885,094, Cl. 210-610.000.

Stacey, William S., Jr. Metal container crushing device. 4,884,502, Cl. 100-233.000.

Stadler, Peter: *See—*
Pleschiutschnigg, Fritz-Peter; Von Schnakenburg, Joachim; Parschat, Lothar; and Stadler, Peter, 4,884,624, Cl. 164-454.000.

Stahl, Carl R. Torsional damper and mounting adapter. 4,884,666, Cl. 188-378.000.

Stahlhofen, Paul; and Mohr, Dieter, to Hoechst Aktiengesellschaft. Burn-in gumming composition for offset printing plates. 4,885,230, Cl. 430-309.000.

Stain, Donald B.: *See—*
Erickson, William R.; Stain, Donald B.; and Wilson, James D., 4,885,148, Cl. 423-309.000.

Staiss, Friedrich: *See—*
Bose, Willibald; Hofinger, Manfred; Hille, Martin; Bohm, Roland; and Staiss, Friedrich, 4,885,110, Cl. 252-341.000.
Bose, Wllibald; Hofinger, Manfred; Hille, Martin; Bohm, Roland; and Staiss, Friedrich, 4,885,111, Cl. 252-344.000.

Stalzer, Richard B.: *See—*
Eppig, Christopher P.; Paspek, Stephen C.; and Stalzer, Richard B., 4,885,079, Cl. 208-13.000.

Stamicarbon B.V.: *See—*
Bakker, Reinier G., 4,885,342, Cl. 525-230.000.

Stamp, John J., to Wm. R. Stewart & Sons (Hacklemakers) Ltd. Fibre opening devices. 4,884,395, Cl. 57-301.000.

Stanadyne Automotive Corp.: *See—*
Kelly, William W., 4,884,549, Cl. 123-506.000.

Stanadyne, Inc.: *See—*
Byers, Hugo; and Lang, Tracy H., 4,884,596, Cl. 137-801.000.

Standard Oil Company, The: *See—*
Eppig, Christopher P.; Paspek, Stephen C.; and Stalzer, Richard B., 4,885,079, Cl. 208-13.000.

Stanislaw, Peter P., to Morrison Berkshire, Inc. Needle loom having improved needle beam guide system. 4,884,324, Cl. 28-107.000.

Stanley, Theodore H.; and Hague, Brian, to University of Utah. Methods and compositions for noninvasive dose-to-effect administration of drugs with cardiovascular or renal vascular activities. 4,885,173, Cl. 424-440.000.

Stannard, John E.: *See—*
Wellman, William H.; and Stannard, John E., 4,885,463, Cl. 250-252.100.

Stapleton, Cecil R., to Westinghouse Electric Corp. Instrumentation port clamps. 4,885,122, Cl. 376-203.000.

STC PLC: *See—*
Greenwood, John C.; Graves, Peter W.; and Neat, Rosamund C., 4,884,450, Cl. 73-702.000.

Steckler, Richard M.: *See—*
Cho, David; and Steckler, Richard M., 4,884,662, Cl. 186-36.000.

Steele, Edward L.: *See—*
Rendahl, Roy; and Steele, Edward L., 4,884,792, Cl. 269-236.000.

Steenod, Wayne: *See—*
Israel, Gary; Steenod, Wayne; and O'Mara, Richard C., 4,884,680, Cl. 206-44.110.

Steeves, Christopher. Roller blind mounting and rolling system. 4,884,618, Cl. 160-321.000.

Steiner, Gerd; Teschendorf, Hans-Juergen; Unger, Liliane; and Binder, Rudolf, to BASF Aktiengesellschaft. 5-substituted 10-cyanomethylenethieno(3,4-B)benzazepines. 4,885,278, Cl. 514-215.000.

Steiner, Ronald O., to Tecumseh Products Company. Fuel cap with tethered anti-splash attachment. 4,884,716, Cl. 220-202.000.

Steinhaus GmbH: *See—*
Wolff, Kurt, 4,885,040, Cl. 156-244.180.

Steinkamp, John O.; Ball, Garry L.; and Radke, Daniel D., to Ford New Holland, Inc. Loader bucket transport link. 4,884,940, Cl. 414-715.000.

Steinmetz, Guy R.; Edgar, Kevin J.; and Falling, Stephen N. Process for the carbonylation of iodoaromatic compounds. 4,885,384, Cl. 562-406.000.

Steinmetz, Harold F.; and Wisdom, Gerald H., to United States of America, Air Force. Automatic fin deployment mechanism. 4,884,766, Cl. 244-3.270.

Steinstrasser, Axel: *See—*
Oberhausen, Erich; Kuhlmann, Ludwig; Seibert, Gerhard; Steinstrasser, Axel; Schroth, Hans-Joachim; and Bremer, Karl-Heinz, 4,885,151, Cl. 424-1.100.

Stella, Domenico: *See—*
Grattarola, Maurizuo; and Stella, Domenico, 4,884,464, Cl. 74-50.000.

Stereographics Corporation: *See—*
Lipton, Lenny; Berman, Arthur; and Meyer, Lawrence D., 4,884,876, Cl. 350-347.00E.

Steris Corporation: *See—*
Kralovic, Raymond C., 4,885,253, Cl. 435-296.000.

Sterling Drug Inc.: *See—*
Bell, Malcolm R., 4,885,295, Cl. 514-235.200.

Stern, David M.: *See—*
Nawroth, Peter P.; Stern, David M.; and Wilner, George D., 4,885,277, Cl. 514-15.000.

Steudler, Frederick W., Jr., to Val Products, Inc. Water pipe bracket and clip for poultry, small animals and the like watering system. 4,884,528, Cl. 119-72.500.

Stevenson, Paul E.: *See—*
Yoder, Douglas J.; Brown, Ronald E.; Stevenson, Paul E.; Hornback, Donald L.; and Leisure, Ronald K., 4,885,621, Cl. 357-26.000.

Steves, Marshall T., to Steves & Sons, Inc. Door unit installation kit with packaging and display container. 4,884,687, Cl. 206-321.000.

Steves & Sons, Inc.: *See—*
Steves, Marshall T., 4,884,687, Cl. 206-321.000.

Stewart, Graham: *See—*
Parson, Brian J.; Shepherd, Roger M.; May, Michael D.; and Stewart, Graham, 4,885,740, Cl. 370-60.000.

Stewart, John V. Electric shaver improvement. 4,884,338, Cl. 30-43.920.

Stewart, Peter A. E.; and Hawkesworth, Michael R., to Rolls-Royce plc. Improvements relating to a method of radioisotope imaging. 4,885,464, Cl. 250-308.000.

Stewart, William M.: *See—*
Parker, William A.; Bartos, Thomas E.; and Stewart, William M., 4,884,665, Cl. 188-322.170.

Steyr-Daimler-Puch AG: *See—*
Schimmel, Johannes; Bauer, Harald; Burian, Gunther; Hulla, Heinz; Kagerer, Robert; and Kubin, Helmut, 4,885,690, Cl. 364-424.100.
Senfter, Emil, 4,884,354, Cl. 42-73.000.

Sticht, Walter, to STIWA-Fertigungstechnik Sticht GesmbH. Assembly method. 4,884,330, Cl. 29-430.000.

Stien, Jerome A. Protective device for dentist handpiece. 4,884,968, Cl. 433-116.000.

Stira, Mark A.: *See—*
Bell, Steven H.; Stira, Mark A.; and Blotzer, James, 4,884,410, Cl. 62-77.000.

STIWA-Fertigungstechnik Sticht GesmbH: *See—*
Sticht, Walter, 4,884,330, Cl. 29-430.000.

Stock, Werner; Baier, Manfred; Kaspar, Klaus P.; and Kirch, Peter, to Boehringer Mannheim GmbH. Immunochemical process and reagent for the determination of a polyvalent antigen in a liquid sample. 4,885,255, Cl. 436-512.000.

Stokes, Ellen J.: *See—*
Burger, Wilhelm F.; Carson, Mark E.; Johri, Abhai; and Stokes, Ellen J., 4,885,789, Cl. 380-25.000.

Stolz, Robert: *See—*
Kispert, Klaus; and Stolz, Robert, 4,884,902, Cl. 384-550.000.

Stone, Mario M. Suspension brace assembly. 4,884,562, Cl. 128-78.000.

Stone, Roger E.: *See—*
Bowers, Thomas E.; Frey, Alan E.; Kerr, Howard A.; Russell, Larry A.; and Stone, Roger E., 4,885,738, Cl. 370-58.100.

Storage Technology Corporation: *See—*
Zweighaft, James, 4,885,676, Cl. 364-178.000.

Stottlemyer, William O.; and Woodward, Steven J., to Alcatel N.V. Apparatus for mounting a unidirectional microphone in a hands-free telephone subset. 4,885,773, Cl. 379-420.000.

Stovall, H. Dean: *See—*
Chien, Kuei-Ru; Hui, Kin-Kwok; Stovall, H. Dean; Wang, John H. S.; and Lamm, Albert J., 4,885,752, Cl. 372-33.000.

Stowell, Dennis E. Continuous determination and control of the weight of hay bales during the baling process. 4,885,531, Cl. 324-65.00P.

Strandholm, John J.; Prochnow, Robert R.; Miller, Mark S.; Woodford, Lawrence E.; and Neunaber, Steven M., to Kraft, Inc. Method for controlling melting properties of process cheese. 4,885,183, Cl. 426-582.000.

Strassheimer, Herbert, to Plasticon Patents, S.A. Plastic preform for forming blow molded plastic bottles. 4,885,197, Cl. 428-36.920.

Strauss, Walter, to Friedrich Deckel Aktiengesellschaft. Radially adjustable tool. 4,884,481, Cl. 82-1.200.

Streicher, Josef. Feeder for a field crop chopper. 4,884,757, Cl. 241-222.000.

Strenzke, Hilmar; and Fehn, Norbert, to Linde Aktiengesellschaft. Control and regulating device for a hydrostatic drive assembly and method of operating same. 4,884,402, Cl. 60-426.000.

Stress-Tek, Inc.: *See—*
Reichow, Keith W., 4,884,644, Cl. 177-137.000.

Strife, James R.: *See—*
Prewo, Karl M.; Nardone, Vincent C.; and Strife, James R., 4,885,212, Cl. 428-552.000.

Stringer, Robert K.: *See—*
Hughan, Robert R.; Hannink, Richard H. J.; Swain, Michael V.; Stringer, Robert K.; Murray, Michael J.; and Garvie, Ronald C., 4,885,266, Cl. 501-104.000.

Strohhacker, Peter: *See—*
Allgauer, Gunter; Strohhacker, Peter; and Fuchs, Dieter, 4,884,700, Cl. 209-685.000.

Stuhr, Leslie P., to Honeywell Inc. Permanent magnet motor with hysteresis drag cup coupling. 4,885,489, Cl. 310-78.000.

Sturdevan, Ronald P., to Prestolite Wire Corporation. Reinforced boot for spark plug cables. 4,884,977, Cl. 439-125.000.

Sturwold, Robert J., to Cincinnati-Vulcan Company. Metalworking lubricants derived from natural fats and oils. 4,885,104, Cl. 252-48.400.

Stutzenberger, Heinz, to Robert Bosch GmbH. Fuel injection pump for combustion engines. 4,884,543, Cl. 123-387.000.

Su-Chin, Chen; L. Flexible tool case accessories compartment assembly structure. 4,884,689, Cl. 206-372.000.

Su, Robert T.: *See—*
Reddel, Roger R.; Yang, Ke; Rhim, Johng S.; Brash, Douglas; Su, Robert T.; Lechner, John F.; Gerwin, Brenda I.; Harris, Curtis C.; and Amstad, Paul, 4,885,238, Cl. 435-29.000.

Suciu, Gabriel L.: *See—*
Brodell, Robert F.; and Suciu, Gabriel L., 4,884,950, Cl. 416-174.000.

Sugawara, Mitsutoshi; and Inamasu, Nami, to NEC Corporation. Digital-to-analog converter circuit. 4,885,581, Cl. 341-145.000.

Sugi, Nagatoshi: *See—*
Aonuma, Mitsuyoshi; and Sugi, Nagatoshi, 4,885,341, Cl. 525-187.000.

Sugiki, Hiraku; Ino, Hiroyuki; and Fukami, Tadashi, to Sony Corporation. Apparatus for reproducing a digital signal. 4,885,647, Cl. 360-73.120.

Sugimoto, Hidehiko; and Tamai, Shinzo, to Mitsubishi Denki Kabushiki Kaisha. Induction motor controller. 4,885,520, Cl. 318-808.000.

Sugimoto, Mamoru; Kohno, Osamu; Ikeno, Yoshimitsu; Sadakata, Nobuyuki; Aoki, Shin'ya; and Nakagawa, Mikio, to Fujikura Ltd. Method of producing a superconducting wire using alloy preform. 4,885,273, Cl. 505-1.000.

Sugiyasu Industries Co., Ltd.: *See—*
Kawada, Hiroyuki, 4,884,936, Cl. 414-498.000.

Suhara, Toshiaki: *See—*
Sunagawa, Hiroshi; Nishihara, Hiroshi; and Suhara, Toshiaki, 4,885,732, Cl. 369-44.000.

Suitor, Jerry W.; Berdahl, C. Martin; and Marner, Wilbur J., to California Institute of Technology. Apparatus in the form of a disk for the separation of oxygen from other gases and/or for the pumping of oxygen and the method of removing the oxygen. 4,885,142, Cl. 423-219.000.

Suizu, Dairi, to Okura Yusoki Kabushiki Kaisha. Transferring and sorting apparatus. 4,884,676, Cl. 198-365.000.

Sullivan, James R., to Eastman Kodak Company. Block adaptive linear predictive coding with adaptive gain and bias. 4,885,636, Cl. 358-133.000.

Sullivan, Michael J., to Spalding & Evenflo Companies, Inc. Golf ball. 4,884,814, Cl. 273-235.00R.

Sulzer Brothers Limited: *See*—
Quack, Hans; and Angelini, Antonio, 4,884,409, Cl. 62-51.100.

Sumi, Sigeo; Hamamura, Fumio; Fukuda, Ichio; Seki, Mitsuhiro; and Sawada, Noriyasu, to Somar Corporation. Laminator. 4,885,048, Cl. 156-552.000.

Sumitomo Chemical Co., Ltd.: *See*—
Enomoto, Masayuki; Nagano, Eiki; Haga, Toru; Morita, Kouichi; and Sato, Ryo, 4,885,024, Cl. 71-92.000.
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, 4,885,125, Cl. 264-328.600.
Kurimoto, Isao; Yamamoto, Hiroki; and Yamaguchi, Tetsuo, 4,885,322, Cl. 524-82.000.
Nakatsuka, Iwao; Okuno, Masami; Shiba, Kunio; and Yoshitake, Akira, 4,885,152, Cl. 424-1.100.
Takao, Hiroyoshi; Imai, Akio; and Seki, Tomoaki, 4,885,338, Cl. 525-77.000.

Sumitomo Electric Industries, Ltd.: *See*—
Fujii, Satoshi, 4,885,133, Cl. 419-29.000.
Okamoto, Kenji; and Kida, Yasushi, 4,885,787, Cl. 382-54.000.

Sumitomo Rubber Industries, Ltd.: *See*—
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Sumitomo Wiring Systems, Ltd.: *See*—
Yoshida, Kinzi; Yamamoto, Akira; and Iura, Kazuo, 4,884,430, Cl. 72-281.000.

Sunagawa, Hiroshi; Nishihara, Hiroshi; and Suhara, Toshiaki, to Fuji Photo Film Co., Ltd. Optical pickup apparatus for detecting and correcting focusing and tracking errors in detected recorded signals. 4,885,732, Cl. 369-44.000.

Sunatori, Go S.: *See*—
Sunter, Stephen K.; and Sunatori, Go S., 4,885,625, Cl. 357-45.000.

Sunbeam Plastics Corporation: *See*—
Julian, Randall K., 4,884,706, Cl. 215-252.000.

Sunderland, Howard f. Game bag for scuba diver. 4,884,732, Cl. 224-252.000.

Sunderland, William J.: *See*—
Lichtman, Jeffrey W.; and Sunderland, William J., 4,884,880, Cl. 350-507.000.
Lichtman, Jeffrey W.; and Sunderland, William J., 4,884,881, Cl. 350-507.000.

Sundstrand Corp.: *See*—
Metcalf, Jeffrey D.; and Klopfenstein, Brent A., 4,884,401, Cl. 60-403.000.
Shekhawat, Sampat S.; Dhyanchand, John J.; and Horowy, John, 4,885,486, Cl. 307-570.000.

Sung, Chong S. P., to University of Connecticut. Fluorescene technique to monitor cure in polymers. 4,885,254, Cl. 436-85.000.

Sunter, Stephen K.; and Sunatori, Go S., to Northern Telecom Limited. Integrated circuit chip manufacture. 4,885,625, Cl. 357-45.000.

Suomen Calcusan Oy-Finska Calcussan AB: *See*—
Kotilainen, Risto M.; and Lilius, Kaj R., 4,885,156, Cl. 424-54.000.

Surendra, Sehgal N.; and Vezina, Claude, to American Home Products Corporation. Use of rapamycin in treatment of certain tumors. 4,885,171, Cl. 424-122.000.

Surinder, Rai: *See*—
Leake, William W.; and Surinder, Rai, 4,885,485, Cl. 307-542.000.

Susko, Robin A.; and Wilson, James W., to International Business Machines Corporation. Plasma reactor having segmented electrodes. 4,885,074, Cl. 204-298.000.

Susumi, Sadao: *See*—
Ginnaga, Akihiro; Nishihara, Tsukasa; Kawahara, Tetsuo; Susumi, Sadao; Mizokami, Hiroshi; and Sakoh, Mitsuo, 4,885,359, Cl. 530-396.000.

Sutton, Alexander G.: *See*—
Pate, Gerry E.; Mullinax, Ronald L.; Sutton, Alexander G.; and Ross, Jeff E., 4,885,706, Cl. 364-551.010.

Suzuki, Hideo: *See*—
Ozawa, Akira; Kousaka, Tomomi; Suzuki, Hideo; and Murakami, Masatoshi, 4,884,332, Cl. 29-568.000.

Suzuki, Ikuo; Yoneda, Takao; Hotta, Takayuki; and Yonezu, Toshihiro, to Toyoda-koki Kabushiki-kaisha. Numerically controlled machine tool. 4,884,373, Cl. 51-165.710.

Suzuki, Katsuo; and Umebayashi, Kazuyuki, to Aisin Seiki Kabushiki Kaisha. Telephone apparatus. 4,885,762, Cl. 379-58.000.

Suzuki, Kazuo, to Hitachi, Ltd. Method of nuclear magnetic resonance imaging and apparatus for the same. 4,885,537, Cl. 324-309.000.

Suzuki, Kenichi: *See*—
Muramatsu, Tadao; Hoshino, Shigeru; Suzuki, Kenichi; and Yamamuro, Shinichi, 4,884,468, Cl. 74-502.400.

Suzuki, Koichi: *See*—
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Suzuki, Kunio; Takamura, Masayuki; and Kubono, Tadashi, to Yamaha Corp. Method for producing a gap spacer for magnetic heads. 4,884,623, Cl. 164-129.000.

Suzuki, Shinichiro: *See*—
Minohara, Kiyomi; Sogabe, Satoshi; and Suzuki, Shinichiro, 4,884,522, Cl. 114-125.000.

Suzuki, Sunao; and Kayamori, Wataru, to Mitsubishi Denki Kabushiki Kaisha. Digital protective relay. 4,885,656, Cl. 361-86.000.

Suzuki, Toichi: *See*—
Asano, Kiro; Matsudaira, Tadahiro; Tamura, Humio; Suzuki, Toichi; and Wada, Hisayuki, 4,885,290, Cl. 514-182.000.

Suzuki, Toshio; and Magara, Takuji, to Mitsubishi Denki Kabushiki Kaisha. Electric discharge machine. 4,885,449, Cl. 219-69.110.

Suzuki, Yoshiaki: *See*—
Inagaki, Yoshio; Adachi, Keiichi; and Suzuki, Yoshiaki, 4,885,228, Cl. 430-270.000.

Svara, Jurgen; and Weferling, Norbert, to Hoechst Aktiengesellschaft. Process for the preparation of tertiary phosphine oxides. 4,885,394, Cl. 568-14.000.

Svendsen, John: *See*—
Bekius, Wayne; and Svendsen, John, 4,884,742, Cl. 239-71.000.

Svensson, Tomas L.: *See*—
Sawicki, Wolfgang H.; Svensson, Tomas L.; Weck, Bernd K.; and Meier-Dornberg, Karl E., 4,884,461, Cl. 73-862.060.

Svyatsky, Eduard, to Bell & Howell Company. Feeder module for use in a document forwarding system. 4,884,797, Cl. 271-126.000.

Swain, Michael V.: *See*—
Hughan, Robert R.; Hannink, Richard H. J.; Swain, Michael V.; Stringer, Robert K.; Murray, Michael J.; and Garvie, Ronald C., 4,885,266, Cl. 501-104.000.

Swartz, Glenn M., Jr.: *See*—
Alving, Carl R.; and Swartz, Glenn M., Jr., 4,885,256, Cl. 436-518.000.

Swedo, Raymond J.; and Zupancic, Joseph J., to Allied-Signal Inc. Process for the preparation of chlorine-resistant semipermeable membranes. 4,885,091, Cl. 210-500.370.

SWF Auto-Electric GmbH: *See*—
Gille, Gunther; and Goertler, Horst, 4,885,512, Cl. 318-444.000.

Swim, William B.: *See*—
Miner, Jonathan L.; Lacher, Vernon R.; Rescigno, Gerald J.; Swim, William B.; Gierke, Martin P.; and Hahn, David A., 4,884,314, Cl. 15-344.000.

Swiss Aluminium Ltd.: *See*—
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Synthelabo: *See*—
Benjamin, Lennette, 4,885,288, Cl. 514-162.000.

Szabo, Leslie I., to Electro Erg Limited. Compensation circuit for electrical generators. 4,885,526, Cl. 322-66.000.

Szu, Tseng; and Shimizu, Tadashi. Rib coupling for hat-like umbrellas. 4,884,586, Cl. 135-26.000.

T.I.R.U. - Traitement Industriel Des Residus Urbains: *See*—
Falconnet, laude, 4,884,515, Cl. 110-171.000.

T. K. Wong & Associates, Ltd.: *See*—
Wong, Tak K., 4,884,989, Cl. 446-168.000.

Tabar, William J. Device for producing three dimensional landscape scenes. 4,885,192, Cl. 428-13.000.

Tabata, Toshiyuki: *See*—
Takeda, Masaru; and Tabata, Toshiyuki, 4,884,789, Cl. 267-140.100.

Tabuchi, Junichiro, to Sanyo Electric Co., Ltd. Digital servo system using microcomputer for controlling phase and speed of rotary body. 4,885,793, Cl. 388-810.000.

Tachi-S Co., Ltd.: *See*—
Sakamoto, Takao, 4,884,777, Cl. 248-588.000.
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Tadokoro, Toyohiko: *See*—
Nagasaki, Yoichi; Nagamoto, Itsushi; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,884,812, Cl. 273-167.00H.

Tager, Lev R.: *See*—
Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

Tago, Nobuo, to Kabushiki Kaisha Toshiba. Determination circuit for data coincidence. 4,885,544, Cl. 328-110.000.

Tai, Ho T., to Lever Brothers Company. Laundry detergents containing fabric-softening clays between 150 and 2000 microns in size. 4,885,101, Cl. 252-8.600.

Taillani, Jean-Claude C.: *See*—
Pham, Lucien; and Taillani, Jean-Claude C., 4,884,903, Cl. 384-563.000.

Taisho Pharmaceutical Co., Ltd.: *See*—
Yoshikawa, Kensei; Ohuchi, Yutaka; Sekiuchi, Kazuto; Saito, Shiuji; Hatayama, Katsuo; and Sota, Kaoru, 4,885,367, Cl. 546-216.000.

Tajima, Ichiro: *See*—
Andou, Masayasu; and Tajima, Ichiro, 4,885,218, Cl. 429-53.000.

Tajima, Kyousuke, to Hosiden Electronics Co., Ltd. Connector socket with a switch. 4,885,438, Cl. 200-51.090.

Takacs, Peter Z.; and Qian, Shi-Nan. Surface profiling interferometer. 4,884,697, Cl. 356-360.000.

Takagi, Osamu: *See*—
Tomizawa, Takashi; and Takagi, Osamu, 4,885,603, Cl. 355-30.000.

Takagi, Shiro; Sato, Minoru; and Izawa, Koji, to Kabushiki Kaisha Toshiba. Electronic document filing apparatus with icon selection. 4,885,704, Cl. 364-521.000.

Takagi, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor apparatus. 4,885,629, Cl. 357-68.000.

Takagi, Yuuji: *See*—
Fukushima, Yoshihisa; Satoh, Isao; Ichinose, Makoto; Kuroki, Yuzuru; and Takagi, Yuuji, 4,885,735, Cl. 369-59.000.
Takahara, Hideyuki; and Kiuchi, Kazuo, to Nippon Telegraph and Telephone Corporation. Perovskite ceramic and fabrication method thereof. 4,885,267, Cl. 501-134.000.
Takahara, Kenichi; and Takahashi, Hiroshi, to Kabushiki Kaisha Toshiba. Non-contact positioning device. 4,885,490, Cl. 310-90.500.
Takahashi, Eiki; Miyazaki, Masahiro; and Nakamura, Kiyoshi, to Hitachi, Ltd. Color cathode-ray tube. 4,885,503, Cl. 313-450.000.
Takahashi, Hidenori: *See*—
Matsuda, Hideki; and Takahashi, Hidenori, 4,884,606, Cl. 152-209.00R.
Takahashi, Hiroshi: *See*—
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Takahashi, Sadao: *See*—
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Takai Tofu & Soymilk Equipment Co.: *See*—
Sengoku, Koji; and Tomita, Misao, 4,884,498, Cl. 99-352.000.
Takamoto, Shigehito: *See*—
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Takamura, Koji: *See*—
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Takamura, Masayuki: *See*—
Suzuki, Kunio; Takamura, Masayuki; and Kubono, Tadashi, 4,884,623, Cl. 164-129.000.
Takao, Hiroyoshi; Imai, Akio; and Seki, Tomoaki, to Sumitomo Chemical Company, Limited. Modified diene polymer rubbers. 4,885,338, Cl. 525-77.000.
Takaragi, Kazuo; Sasaki, Ryoichi; Shiraishi, Takayoshi; and Kurashiki, Nobuhiro, to Hitachi, Ltd. Electronic transaction system. 4,885,777, Cl. 380-30.000.
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Takasago Perfumery Co., Ltd.: *See*—
Yamada, Nobuo; and Kobayashi, Toyohiko, 4,885,274, Cl. 512-16.000.
Takata, Toshimasa: *See*—
Tominaga, Kaoru; Kan, Kojiro; Takata, Toshimasa; and Tomoshige, Toru, 4,885,329, Cl. 524-430.000.
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Yamagishi, Yutaka; and Takeda, Kenji, 4,885,469, Cl. 250-345.000.
Takeda, Masaru; and Tabata, Toshiyuki, to Nissan Motor Co. Ltd. Power unit mounting device. 4,884,789, Cl. 267-140.100.
Takehana, Sakae; Ueda, Yasuhiro; and Sakurai, Tomohisa, to Olympus Optical Co., Ltd. Endoscope for automatically adjusting an angle with a shape memory alloy. 4,884,557, Cl. 128-4.000.
Takei, Masahiro: *See*—
Shikakura, Akihiro; Takahashi, Koji; Takei, Masahiro; and Sasatani, Tomohiko, 4,885,637, Cl. 358-133.000.
Takei, Takako: *See*—
Hani, Kiyoshi; Takei, Takako; Kodama, Minekazu; and Watanabe, Takahiko, 4,885,058, Cl. 162-145.000.
Takenaka, Fumio; Tohya, Kouzi; and Ohtsuka, Yoshihiro, to 501 Daicel Chemical Industries Ltd. Photopolymerizable compositions. 4,885,229, Cl. 430-285.000.
Takesue, Toshiharu: *See*—
Yamamoto, Hiroyoshi; Takesue, Toshiharu; and Kawawada, Naoki, 4,884,859, Cl. 350-96.150.
Takeuchi, Masaru; Gotoh, Kazuyuki; Wakisaka, Kenichiro; Honma, Kazuhiko; Fukatsu, Takeo; Nakano, Shoichi; and Kuwano, Yukinori, to Sanyo Electric Co., Ltd. Electrophotographic photosensitive sensor. 4,885,226, Cl. 430-65.000.
Takeya, Noriyoshi: *See*—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,885,644, Cl. 358-342.000.
Takeyasu, Hatsuichi; Sakata, Kenichi; and Yura, Fumitoshi, to Asahi Kogaku Kogyo K.K. Polygonal mirror and method of making same. 4,884,856, Cl. 350-6.800.
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Sakamoto, Takao; and Takizawa, Kiyotaka, 4,885,513, Cl. 318-468.000.
Tamai, Shinzo: *See*—
Sugimoto, Hidehiko; and Tamai, Shinzo, 4,885,520, Cl. 318-808.000.
Tamura, Hideyuki, to Nissan Motor Company, Limited. Air/fuel ratio control system for internal combustion engine with variable control characteristics depending upon precision level of control parameter data. 4,884,547, Cl. 123-489.000.
Tamura, Humio: *See*—
Asano, Kiro; Matsudaira, Tadahiro; Tamura, Humio; Suzuki, Toichi; and Wada, Hisayuki, 4,885,290, Cl. 514-182.000.
Tamura, Zenji; Sakurada, Kenji; and Nakada, Akihiko, to Tsudakoma Corp. Pile warp yarn tension control. 4,884,597, Cl. 139-102.000.
Tan, Cheng; and Jiang, Lihua. Swinging-piston internal-combustion engine. 4,884,532, Cl. 123-18.00R.
Tanahashi, Kenji: *See*—
Hashimoto, Nobuo; Ishii, Hideo; Tanahashi, Kenji; Ohno, Kenji; and Ohno, Kiichi, 4,884,894, Cl. 366-338.000.
Tanaka, Hideshi; Yagi, Kazuyuki; Tanimoto, Shigeru; Komatsu, Yasuaki; Yanagawa, Koichi; and Kuboyama, Yoichi, to Hewlett-Packard Company. Apparatus which uses a simulated inductor in the measurement of an electrical parameter of a device under test. 4,885,528, Cl. 324-57.00R.
Tanaka, Hisakatsu: *See*—
Horiguchi, Toshio; Akatsuka, Yuichiro; and Tanaka, Hisakatsu, 4,885,458, Cl. 235-454.000.
Tanaka, Koji; Nishikawa, Kazunori; and Yamada, Kazuya, to Victor Company of Japan, Ltd. Method and apparatus for error correction. 4,885,750, Cl. 371-37.400.
Tanaka, Masayuki: *See*—
Hosoda, Naoyuki; Tanaka, Masayuki; and Mori, Tamotsu, 4,885,135, Cl. 420-507.000.
Tanaka, Norio: *See*—
Baba, Masatoshi; Kakuta, Takuya; Tanaka, Norio; Oya, Eiichi; Ikai, Takashi; Nawamaki, Tsutomu; and Watanabe, Shigeomi, 4,885,022, Cl. 71-86.000.
Tanaka, Sakuya: *See*—
Seto, Kiyotomo; Tanaka, Sakuya; and Sakoda, Ryozo, 4,885,284, Cl. 514-89.000.
Tanaka, Teruya; and Matsuo, Katsuharu, to Kabushiki Kaisha Toshiba. Temperature controller. 4,885,456, Cl. 219-497.000.
Tanaka, Toshiaki, to Nissan Motor Co., Ltd. Diesel engine swirl chamber. 4,884,538, Cl. 123-263.000.
Tanaka, Yoshimasa; and Tasaki, Yutaka, to Nissan Motor Co., Ltd. Exhaust manifold of internal combustion engine. 4,884,400, Cl. 60-323.000.
Tanashin Denki Co., Ltd.: *See*—
Yoshimura, Toshio, 4,885,648, Cl. 360-96.500.
Tandem Computers Incorporated: *See*—
Pham, Hoa; and Max, Robert C., 4,885,436, Cl. 200-50.00A.
Tang, Ching W.; and VanSlyke, Steven A., to Eastman Kodak Company. Electroluminescent device with improved cathode. 4,885,211, Cl. 428-457.000.
Tanigaki, Masanobu: *See*—
Sotoya, Kohshiro; Kubo, Makoto; Okabe, Kazuhiko; Tanigaki, Masanobu; Yamanishi, Masaji; and Hirota, Hajime, 4,885,112, Cl. 252-352.000.
Taniguchi, Hisaya, to Kabushiki Kaisha Toshiba. High-frequency transformer for microwave oven. 4,885,445, Cl. 219-10.55B.
Tanimoto, Shigeru: *See*—
Tanaka, Hideshi; Yagi, Kazuyuki; Tanimoto, Shigeru; Komatsu, Yasuaki; Yanagawa, Koichi; and Kuboyama, Yoichi, 4,885,528, Cl. 324-57.00R.
Taoda, Masami; and Machida, Hironobu, to Kabushiki Kaisha Toshiba. Data processing apparatus for editing, filing, and printing image data by means of visual observation of the data on a display screen. 4,885,699, Cl. 364-518.000.
Target Therapeutics: *See*—
Engelson, Erik T., 4,884,579, Cl. 128-772.000.
Tasaki, Yutaka: *See*—
Tanaka, Yoshimasa; and Tasaki, Yutaka, 4,884,400, Cl. 60-323.000.
Tate, David L., to Avco Corporation. Compressor flow fence. 4,884,944, Cl. 415-156.000.
Tatham, Gerald F. Sliding door closer. 4,884,369, Cl. 49-404.000.
Taunton Technologies, Inc.: *See*—
Telfair, William B.; Martin, Clifford A.; Gordon, Eugene I.; and Fricke, William C., 4,885,471, Cl. 250-461.100.
Taylor, Garthwood R.: *See*—
Denman, Stephen A.; and Taylor, Garthwood R., 4,884,785, Cl. 254-389.000.
Taylor, Paul D.: *See*—
De Thomas, Waldo; and Taylor, Paul D., 4,885,411, Cl. 568-864.000.
Taylor, Warren A. Front loading sign assembly. 4,884,353, Cl. 40-611.000.
TDK Corporation: *See*—
Odagawa, Yoshimoto; and Yanagisawa, Yasushi, 4,885,535, Cl. 324-207.000.
Shiba, Haruo; Okamura, Masatoshi; and Hashizume, Kenji, 4,885,651, Cl. 360-132.000.
Technion Research and Development Foundation Ltd.: *See*—
Schmuckler, Gabriella, 4,885,143, Cl. 423-22.000.
Tecumseh Products Company: *See*—
Marriott, Lee W., 4,884,541, Cl. 123-361.000.
Richardson, Hubert, Jr., 4,884,955, Cl. 418-1.000.
Steiner, Ronald O., 4,884,716, Cl. 220-202.000.
Teijin Limited: *See*—
Yamamoto, Michio; Kiriyama, Tsutomu; Sasaki, Noriaki; Sakamoto, Yoshitaka; and Ishimaru, Kenji, 4,885,057, Cl. 162-9.000.
Tektronix, Inc.: *See*—
Beck, Kent L.; and Cunningham, Howard G., Jr., 4,885,717, Cl. 364-900.000.
Bell, Marshall J., Jr.; and Draper, Daniel S., 4,885,547, Cl. 330-254.000.
Buzak, Thomas S.; and Vatne, Rolf S., 4,884,874, Cl. 350-336.000.
Miller, Norbert, 4,885,713, Cl. 364-604.000.

Sanielevici, Sergio A., 4,885,545, Cl. 328-151.000.
Wimmer, Guenther W., 4,885,554, Cl. 331-25.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Guidoux, Loic B. Y., 4,885,737, Cl. 370-32.100.
Telefonaktiebolaget L M Ericsson: *See*—
Gustafsson, Sune M., 4,885,772, Cl. 379-390.000.
Telephone and Telegraph Company: *See*—
Dix, Willard A., 4,885,435, Cl. 200-1.00B.
Telfair, William B.; Martin, Clifford A.; Gordon, Eugene I.; and Fricke, William C., to Taunton Technologies, Inc. Ultraviolet radiometer. 4,885,471, Cl. 250-461.100.
Temple, Victor A. K., to Electric Power Research Institute. High power multi-layer semiconductive switching device having multiple parallel contacts with improved forward voltage drop. 4,885,630, Cl. 357-71.000.
Temple, William A. Bicycle carrier. 4,884,728, Cl. 224-42.130.
Tenconi, Riccardo, to MEC-MOR S.P.A. Needle selection device in knitting, sock- and stocking-making machines and the like. 4,884,417, Cl. 66-220.000.
ten Hoeve, Wolter: *See*—
Wynberg, Hans; and ten Hoeve, Wolter, 4,885,375, Cl. 549-557.000.
Tennessee Valley Authority: *See*—
Elrod, Jimmie L., 4,885,021, Cl. 71-28.000.
Tenniswood, David M.; Pea, Kevin I.; and Loeck, Steven M., to Gleason Reel Corp. Rotating cam limit switch. 4,885,437, Cl. 200-31.00R.
Tenzer, Frederick D.: *See*—
Nowell, Gilbert S.; and Tenzer, Frederick D., 4,885,659, Cl. 361-212.000.
Terakawa, Takashige: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,884,580, Cl. 128-804.000.
Terreur, Frederic, to Centre De Recherches Metallurgiques Centrum Voor Research in De Metallurgie. Device for modulating a laser beam. 4,885,751, Cl. 372-26.000.
Terry, Thomas E.: *See*—
Graham, S. Neal; and Terry, Thomas E., 4,884,678, Cl. 198-392.000.
Terzian, Rouben T., to Breslow, Morrison, Terzian & Associates, Inc. Poseable soft doll. 4,884,991, Cl. 446-369.000.
Teschendorf, Hans-Juergen: *See*—
Steiner, Gerd; Teschendorf, Hans-Juergen; Unger, Liliane; and Binder, Rudolf, 4,885,278, Cl. 514-215.000.
Tesic, Mike M.: *See*—
Sones, Richard A.; Tesic, Mike M.; and Vidmar, James F., 4,885,761, Cl. 378-197.000.
Texaco Canada Resources: *See*—
McKay, Alexander S.; Livesey, Declan B.; and Harris, Philip, 4,884,635, Cl. 166-271.000.
Texaco Inc.: *See*—
Harrison, Charles W.; Gerondale, Michael J.; Patrone, Anthony J.; and Ong, James O. Y., 4,885,062, Cl. 196-14.500.
Hatton, Gregory J., 4,884,457, Cl. 73-861.040.
Texas Alkyls, Inc.: *See*—
Piotrowski, Andrzej M.; and Malpass, Dennis B., 4,885,406, Cl. 568-716.000.
Texas Instruments Incorporated: *See*—
Cox, Ned, 4,885,488, Cl. 310-68.00R.
Head, Claude D., III, 4,884,674, Cl. 198-341.000.
Negishi, Hidetaka; and Aoki, Shigemitsu, 4,885,574, Cl. 340-711.000.
Provence, John D., 4,885,757, Cl. 375-96.000.
Trenkler, George; and Delagi, Richard G., 4,885,214, Cl. 428-614.000.
Tezuka, Kazunari: *See*—
Fujiki, Haruo; and Tezuka, Kazunari, 4,884,650, Cl. 180-197.000.
Thefaine, Yannick J.: *See*—
Perry, Kenneth J.; Thefaine, Yannick J.; Hailpern, Brent T.; Hovevel, Lee W.; and Shea, Dennis G., 4,885,578, Cl. 340-825.520.
Thein, Joe K.; and Uldrich, Flerida B., to Northrop Corporation. Press forming process and apparatus for plastic foam and plastic foam product. 4,885,317, Cl. 521-149.000.
Thelen, Alfred: *See*—
Campbell, Gregor A.; Conn, Robert W.; Goebel, Dan M.; Adam, Rolf; Aichert, Hans; Betz, Hans; Dietrich, Anton; Dittmer, Gonde; Hartig, Klaus; Hass, Friedrich; Ludwig, Rainer; Mayr, Max; and Thelen, Alfred, 4,885,070, Cl. 204-192.110.
Theodoridis, George, to FMC Corporation. Herbicidal tetrazolinones and use thereof. 4,885,025, Cl. 71-92.000.
Thermalloy Incorporated: *See*—
Hinshaw, Howard G., 4,884,331, Cl. 29-558.000.
Thermo King Corporation: *See*—
Johnson, Richard A.; Anderson, Arthur A.; and Boomgaard, Dirk J., 4,885,563, Cl. 340-310.00A.
Vercellotti, Leonard C.; Anderson, Arthur A.; Christiansen, David A.; Johnson, Dannis R.; Brickner, Laurence R.; Colclaser III, Robert G.; and Leddy, John G., 4,885,564, Cl. 340-310.00A.
Thermocell, Ltd.: *See*—
Schnebly, John T., 4,885,190, Cl. 427-207.100.
Thern, Royal G.: *See*—
McIntosh, R. Bruce; and Thern, Royal G., 4,884,783, Cl. 254-343.000.
Therrien, John L. Blue-box fraud prevention. 4,885,767, Cl. 379-189.000.
Theta Technologies, Inc.: *See*—
McCarthy, Walton, 4,884,709, Cl. 220-5.00A.
Theurer, Josef; Hansmann, Johann; and Oellerer, Friedrich, to Franz Plasser Bannbaumaschinen-Industriegesellschaft m.b.H. Mobile tie gang apparatus. 4,884,509, Cl. 104-9.000.
Thevenet, Guy, to Ceraver, S.A. Method of connecting a metal end fitting to an insulator component having an elastomer end fin and an organic electrical insulator obtained by the method. 4,885,039, Cl. 156-294.000.
Thomas, Ulrich: *See*—
Maassen, Wilhelm; Gebald, Gregor; and Thomas, Ulrich, 4,884,699, Cl. 209-587.000.
Thompson, Allan: *See*—
Campbell, John G.; and Thompson, Allan, 4,884,394, Cl. 57-264.000.
Thompson, Andy L. Rotary screen for pneumatic grain handling. 4,885,012, Cl. 55-290.000.
Thomson-CSF: *See*—
Coutures, Jean-Louis, 4,885,626, Cl. 377-58.000.
Thorn, Inc.: *See*—
McIntosh, R. Bruce; and Thern, Royal G., 4,884,783, Cl. 254-343.000.
Thorne, James M.: *See*—
Woodbury, Richard C.; Perkins, Raymond T.; and Thorne, James M., 4,885,055, Cl. 156-647.000.
Thornfeldt, Carl R. Treatment of hyperhidrosis, ichthyosis and wrinkling. 4,885,282, Cl. 514-53.000.
Thornley, David J.; Smith, Moira A.; Dale, Philip; Leask, Samuel H.; and Coutts, Ian M., to Marconi Company Limited, The. Means for forcing apart two structural members of a closure arrangement. 4,884,368, Cl. 49-276.000.
Thottathil, John K., to E. R. Squibb & Sons, Inc. Resolution process for benzazepine intermediates. 4,885,364, Cl. 540-523.000.
Thottathil, John K. Process for preparing phosphonyloxyacyl amino acids and derivatives thereof. 4,885,380, Cl. 558-83.000.
Thrall Car Manufacturing Company: *See*—
Hallam, Keith J.; and Smith, Kenneth H., 4,884,511, Cl. 105-247.000.
Thrift, Robert L.; and Morris, Paul K., to General Electric Company. Method of phase and amplitude correction of NMR signals using a reference marker. 4,885,549, Cl. 324-307.000.
Throckmorton, Rodney A., to Siecor Corporation. Optical fiber splicing enclosure for installation in pedestals. 4,884,863, Cl. 350-96.200.
Thurow, Horst, to Hoechst Aktiengesellschaft. Aqueous protein solutions stable to denaturation. 4,885,164, Cl. 424-85.400.
Tiegel Manufacturing: *See*—
Wegner, Paul C., 4,885,007, Cl. 29-623.500.
Tietz, Anthony J.: *See*—
Huber, Floyd M.; Pieper, Richard L.; and Tietz, Anthony J., 4,885,243, Cl. 435-71.300.
Tight, Dexter C., Jr.; and Moisson, Marc F., to Raychem Corporation. Re-enterable closure assembly. 4,885,194, Cl. 428-34.900.
Ting, Chiu H.; Rucker, Thomas G.; and Sobczak, Zbigniew P., to Intel Corporation. Chemical modification of spin-on glass for improved performance in IC fabrication. 4,885,262, Cl. 437-231.000.
Tiyony, Joseph. Chance device with variably sized number selecting compartments. 4,884,810, Cl. 273-144.00B.
Tobita, Etsuo: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Tobita, Etsuo, 4,885,323, Cl. 524-95.000.
Tobler, Peter, to Equus Marketing Corp. Arm chair, particularly office arm chair, with adjustable arm rests. 4,884,846, Cl. 297-411.000.
Tochigifujisangyo Kabushiki Kaisha: *See*—
Onoue, Toshinobu, 4,884,470, Cl. 74-710.500.
Toda, Haruhiko: *See*—
Miyake, Miyuki; Toda, Haruhiko; and Yasu, Minako, 4,885,159, Cl. 424-70.000.
Tohya, Kouzi: *See*—
Takenaka, Fumio; Tohya, Kouzi; and Ohtsuka, Yoshihiro, 4,885,229, Cl. 430-285.000.
Toja, Emilio; Gorini, Carlo; Barzaghi, Fernando; and Galliani, Giulio, to Roussel Uclaf. Derivatives of 1-arylsulphonyl-2-oxo-5-alkoxy-pyrrolidine and medical compositions containing them. 4,885,306, Cl. 514-425.000.
Toja, Emilio; Gorini, Carlo; Barzaghi, Fernando; and Galliani, Giulio, to Roussel Uclaf. Derivatives of 1-arylsulphonyl-1,5-dihydro-2H-pyrrol-2-one, and compositions containing them. 4,885,307, Cl. 514-425.000.
Tokai Corporation: *See*—
Nitta, Tomio, 4,884,964, Cl. 431-277.000.
Nitta, Tomio, 4,884,965, Cl. 431-277.000.
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Yada, Yukihiko; and Kishio, Toshiaki, 4,884,380, Cl. 52-208.000.
Tokheim Corporation: *See*—
Simcoe, Steven B.; Orth, Charles M.; and VanDaele, John J., 4,885,443, Cl. 200-296.000.
Tokico Ltd.: *See*—
Endo, Mitsuhiro, 4,884,491, Cl. 91-369.200.
Tokushige, Kazutomo: *See*—
Nitoh, Toshikatsu; and Tokushige, Kazutomo, 4,885,321, Cl. 523-219.000.
Tokyo Keiki Co. Ltd.: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,884,580, Cl. 128-804.000.
Tokyo Koshumosu Denki Kabushiki Kaisha: *See*—
Miwa, Hirohide, 4,885,764, Cl. 379-70.000.

Tolle, Michael C.: *See*—
Bartholomew, Wesley E.; and Tolle, Michael C., 4,885,662, Cl. 361-386.000.

Tolstopyatov, Konstantin S.: *See*—
Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

Tominaga, Kaoru; Kan, Kojiro; Takata, Toshimasa; and Tomoshige, Toru, to Mitsui Petrochemical Industries, Ltd. Polyimide resin compositions. 4,885,329, Cl. 524-430.000.

Tomita, Akira: *See*—
Ellis, Roger H.; Walton, A. Christian; and Tomita, Akira, 4,884,864, Cl. 350-96.210.

Tomita, Misao: *See*—
Sengoku, Koji; and Tomita, Misao, 4,884,498, Cl. 99-352.000.

Tomizawa, Takashi; and Takagi, Osamu, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus for producing glossy image medium. 4,885,603, Cl. 355-30.000.

Tomoda, Toshimasa; Badono, Shinji; and Komaru, Masaki, to Mitsubishi Denki Kabushiki Kaisha; and Petro-Canada, Inc. Measurement apparatus employing radiation. 4,885,759, Cl. 378-53.000.

Tomoshige, Toru: *See*—
Tominaga, Kaoru; Kan, Kojiro; Takata, Toshimasa; and Tomoshige, Toru, 4,885,329, Cl. 524-430.000.

Tompkins, Rodney R.: *See*—
Shockey, Brent J.; and Tompkins, Rodney R., 4,884,514, Cl. 109-24.100.

Toms, Douglas: *See*—
Kolodesh, Michael S.; Cash, Walter, Jr.; Davis, Jerry E.; Gosselin, Peter G.; Kock, Ronald W.; Pierson, Bruce A.; Reiboldt, H. Norman; Sabatelli, David A.; and Toms, Douglas, 4,885,182, Cl. 426-482.000.

Tomuro, Jinichi: *See*—
Miyamoto, Tomohiko; Koyama, Shuntaro; Tomuro, Jinichi; Morihara, Atsushi; Yamashita, Hisao; Takahashi, Sadao; Kida, Eiji; Ueda, Akio; and Takamoto, Shigehito, 4,884,396, Cl. 60-39.120.

Tong, Hua Sou, to Zenith Electronics Corporation. Blackening of non iron-based flat tensioned foil shadow masks. 4,885,501, Cl. 313-402.000.

Tootle, James N., to Pneumo Abex Corporation. Fluid actuator including a ballistically tolerant rod gland bearing. 4,884,493, Cl. 92-128.000.

Topilin, Valentin V., deceased: *See*—
Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

Topilina, Tatyana V., administrator: *See*—
Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

Torii, Shunichi: *See*—
Kojima, Keiji; Torii, Shunichi; and Sakata, Akiharu, 4,885,678, Cl. 364-200.000.

Torkhov, Gennady F.: *See*—
Paton, Boris E.; Latash, Jury V.; Torkhov, Gennady F.; Reida, Nikolai V.; Bukalo, Alfred I.; Kedrin, Vladimir K.; Melnik, Gary A.; Pryanishnikov, Igor S.; Tolstopyatov, Konstantin S.; Tager, Lev R.; Kljuev, Mikhail M.; Modelkin, Jury I.; Sokolkin, Boris P.; Andrianov, Alexei K.; Topilin, Valentin V., deceased; Topilina, Tatyana V., administrator; Guschin, Sergei G., deceased; Guschina, Alevtina V., administrator; Korobkova, Ljudmila S., administrator; and Kuznetsova, Tatyana S., administrator, 4,884,625, Cl. 164-495.000.

Toth, Vincent A.: *See*—
Kasner, William H.; Kun, Zoltan K.; Leksell, David; and Toth, Vincent A., 4,885,448, Cl. 219-121.690.

Toto Ltd.: *See*—
Ito, Haruyuki; and Matsumoto, Akio, 4,884,959, Cl. 425-84.000.

Toupin, Joseph; and Douesnel, Xavier, to Douesnel, Xavier. Method and device for detecting the temperature to which a solid, a liquid or a gas may have been subjected. 4,884,897, Cl. 374-160.000.

Toyoda Gosei Co., Ltd.: *See*—
Nozaki, Masahiro; and Hikosaka, Atusi, 4,884,370, Cl. 49-479.000.

Toyoda-koki Kabushiki-kaisha: *See*—
Suzuki, Ikuo; Yoneda, Takao; Hotta, Takayuki; and Yonezu, Toshihiro, 4,884,373, Cl. 51-165.710.

Toyoshima, Shuji: *See*—
Ichimura, Shigeru; Nakasuna, Seiko; Kawarai, Takeshi; Nishiyama, Takanori; and Toyoshima, Shuji, 4,885,643, Cl. 358-335.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Kouno, Katsumi, 4,884,653, Cl. 180-233.000.
Miyamoto, Noritaka; Koujiya, Miyuki; Miyake, Joji; Iomoda, Takashi; Ohsawa, Hidetoshi; and Nagami, Tetsuo, 4,885,213, Cl. 428-612.000.
Muramatsu, Tadao; Hoshino, Shigeru; Suzuki, Kenichi; and Yamamuro, Shinichi, 4,884,468, Cl. 74-502.400.

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Morita, Izuru; Kishitani, Keisuke; Kajitani, Masayoshi; Tozawa, Shoji; Satoh, Masanori; Otabe, Kisaburo; and Onda, Mamoru, 4,884,398, Cl. 60-274.000.

Tracy, David J.; Rizzo, Thomas; and Login, Robert B., to GAF Corporation. Heat stable quaternized lactams having oxylated sulfur anions. 4,885,158, Cl. 424-69.000.

Tracy, David J.; and Hashem, Mohamed M., to GAF Chemicals Corporation. Process for the preparation of purified N-alkyl lactams. 4,885,371, Cl. 548-554.000.

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Donavich, John X., 4,884,496, Cl. 98-6.000.

Traugott, Thomas D.; Moore, Eugene R.; and Malanga, Michael T., to Dow Chemical Company, The. Polyphenylene ether/polystyrene blends. 4,885,339, Cl. 525-132.000.

Trema, Daniel, to Elf France. Device for supporting and attaching a disk brake caliper. 4,884,663, Cl. 188-18.00A.

Trenkler, George; and Delagi, Richard G., to Texas Instruments Incorporated. Composite material and methods for making. 4,885,214, Cl. 428-614.000.

Tri-tech, Inc.: *See*—
Cooper, Roy; and Hansen, Charles, 4,884,333, Cl. 29-596.000.

Triche, Freddie J. Arm protector. 4,884,297, Cl. 2-16.000

Trott, Arthur F.: *See*—
Bays, F. Barry; Trott, Arthur F.; and Marchand, Sam R., 4,884,572, Cl. 128-334.00R.

Troxell, Jack D.: *See*—
Buerkle, Thomas B.; and Troxell, Jack D., 4,885,029, Cl. 75-235.000.

Trujillo, David A.: *See*—
McMahon, William A., Jr.; Trujillo, David A.; and Lyle, Robert E., Jr., 4,885,327, Cl. 524-376.000.

Tschang, Pin S.; Pham, Hieu T.; and Kieffer, Kenneth D., to Eastman Kodak Company. Non-impact printer apparatus with improved current mirror driver and method of printing. 4,885,597, Cl. 364-519.000.

Tsuboi, Hiroaki, to Pioneer Electric Corporation. Method of, and system for, detecting an excessive loading condition of multiple disks in a video disk apparatus. 4,885,733, Cl. 369-45.000.

Tsuchiya, Kikuo; Araki, Shingo; Inagaki, Masaji; Kudoh, Yumi; and Kitao, Teijiro, to Dainippon Ink and Chemicals, Inc. Novel thermosensitive recording sheet. 4,885,270, Cl. 503-209.000.

Tsudakoma Corp.: *See*—
Tamura, Zenji; Sakurada, Kenji; and Nakada, Akihiko, 4,884,597, Cl. 139-102.000.

Tsuji, Kiyoshi: *See*—
Matsuo, Masaaki; Morino, Daizo; Tsuji, Kiyoshi; and Okumura, Hiroyuki, 4,885,297, Cl. 514-253.000.

Tsuji, Masahiro: *See*—
Mori, Kenji; and Tsuji, Masahiro, 4,885,246, Cl. 435-123.000.

Tsuji, Shinji: *See*—
Okai, Makoto; Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; and Chinone, Naoki, 4,885,753, Cl. 372-45.000.

Tsuneeda, Kenichi, to Kabushiki Kaisha Toshiba. Electrophotography apparatus and electrophtographic process for developing positive image from positive or negative film. 4,885,221, Cl. 430-100.000.

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Ikeda, Takashi; and Tsunoda, Euji, 4,884,934, Cl. 411-383.000.

Tuckey, Charles H., to Walbro Corporation. Motor-driven material level indicator. 4,884,444, Cl. 73-290.00R.

Tunoda, Kikuo, to Ryobi Ltd. Bail arm turning mechanism for spinning reel. 4,884,762, Cl. 242-236.000.

Turner, Barry S.: *See*—
Belanger, James A.; Wentworth, Robert J.; Turner, Barry S.; and Astley, Graham J., 4,884,946, Cl. 415-206.000.

Turznik, Gerhard: *See*—
Graalmann, Onno; Kreibiehl, Guenter; Turznik, Gerhard; and Weber, Heinz, 4,885,206, Cl. 428-316.600.

Tuszynski, Alfons: *See*—
Warner, Raymond M., Jr.; Schrimpf, Ronald D.; and Tuszynski, Alfons, 4,885,615, Cl. 357-22.000.

Tutamune, Hirotaka; Shiragai, Yasuo; Karino, Yoshiaki; and Wakasa, Yasuyuki, to Hitachi, Ltd. Apparatus for handling sheets of paper. 4,884,698, Cl. 209-534.000.

Tweedle, Michael F.; Gaughan, Glen T.; and Hagan, James T., to E. R. Squibb & Sons, Inc. 1-substituted-1,4,7-triscarboxymethyl-1,4,7,10-tetraazacyclododecane and analogs. 4,885,363, Cl. 540-465.000.

Tyree, Gerald W.: *See*—
Smith, Charles R.; Brindisi, Anthony E.; and Tyree, Gerald W., 4,884,929, Cl. 411-3.000.

Uchida, Koh; Kurihara, Takashi; and Miyoshi, Makoto, to Nissan Motor Company, Limited. Variable assist power steering system with varying power assist characteristic. 4,884,648, Cl. 180-142.000.

Uchinami, Masanobu: *See*—
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Uchiyama, Akira; Masaki, Yuuichi; Iwabuchi, Toshiyuki; Nomoto, Tsutomu; and Sakamoto, Masaaki, to Oki Electric Industry Co., Ltd. Pin photodiode and method of fabrication of the same. 4,885,622, Cl. 357-30.000.

Udagawa, Takatoshi: *See*—
Kawai, Yoichi; Udagawa, Takatoshi; Imakita, Takeshi; and Yokote, Sachio, 4,885,162, Cl. 424-83.000.

Udseth, Harold R.: *See*—
Smith, Richard P.; Udseth, Harold R.; and Olivares, Jose A., 4,885,076, Cl. 204-299.00R.

Ueda, Akio: *See*—
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Ueda, Yasuhiro: *See*—
Takehana, Sakae; Ueda, Yasuhiro; and Sakurai, Tomohisa, 4,884,557, Cl. 128-4.000.

Ueha, Sadayuki; Kurosawa, Minoru; and Masuda, Michiyuki, to NGK Spark Plug Co., Inc. Ultrasonic driven type motor. 4,885,499, Cl. 310-328.000.

Uemura, Haruo, to Dainippon Screen Mfg., Co., Ltd. Fly's eye lens unit for illumination system. 4,884,869, Cl. 350-169.000.

Uldrich, Flerida B.: *See*—
Thein, Joe K.; and Uldrich, Flerida B., 4,885,317, Cl. 521-149.000.

Umaba, Toshihiko: *See*—
Hashimoto, Yutaka; Kamei, Masayuki; and Umaba, Toshihiko, 4,884,866, Cl. 350-96.340.

Umebayashi, Kazuyuki: *See*—
Suzuki, Katsuo; and Umebayashi, Kazuyuki, 4,885,762, Cl. 379-58.000.

Umemoto, Isao; Shimada, Fumiyo; and Mitsuno, Yuichiro, to Kao Corporation. Quick-drying pack-type face-cleansing composition. 4,885,109, Cl. 252-174.210.

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Undersea Industries, Inc.: *See*—
Lamont, Mark D., 4,884,564, Cl. 128-201.110.

Unger, Liliane: *See*—
Steiner, Gerd; Teschendorf, Hans-Juergen; Unger, Liliane; and Binder, Rudolf, 4,885,278, Cl. 514-215.000.

Unigovsky, Mikhail R.: *See*—
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Kharchenko, Alexandr K.; and Unigovsky, Mikhail R., 4,885,450, Cl. 219-101.000.

Union Carbide Corporation: *See*—
Billig, Ernst; Abatjoglou, Anthony G.; and Bryant, David R., 4,885,401, Cl. 568-454.000.
Jackson, John E.; and Balmer, Norman L., 4,884,820, Cl. 277-53.000.
Shaffer, Gregory W., 4,884,788, Cl. 266-275.000.

Union Oil Company of California: *See*—
Biale, John, 4,885,320, Cl. 523-201.000.
Young, Donald C., 4,885,425, Cl. 585-458.000.

Unisys Corporation: *See*—
Banka, Eugene F.; and Hebeler, Charles B., 4,885,650, Cl. 360-122.000.
Coogan, Ronald S., 4,885,683, Cl. 364-200.000.
El-Sadi, Ashraf I., 4,885,516, Cl. 318-615.000.
Henze, Christopher P.; and Smith, James A., 4,885,675, Cl. 363-26.000.

United Kingdom Atomic Energy Authority: *See*—
Coad, Joseph P.; Rickerby, David S.; and Warrington, Philip, 4,885,069, Cl. 204-192.310.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
McCanny, John V.; Evans, Richard A.; and McWhirter, John G., 4,885,715, Cl. 364-728.010.

United Power Corporation: *See*—
Van Sickle, Robert J., 4,885,492, Cl. 310-113.000.

United States of America
Agriculture: *See*—
Krochta, John M., 4,885,387, Cl. 562-515.000.
Air Force: *See*—
Berthel, Robert O., 4,884,440, Cl. 73-170.00R.
Hutta, Joseph J., 4,885,019, Cl. 65-3.110.
Leonard, John F.; and Beam, Jerry E., 4,885,129, Cl. 419-2.000.
McQuillan, Barry W.; and Reynolds, George H., 4,885,120, Cl. 264-60.000.
Steinmetz, Harold F.; and Wisdom, Gerald H., 4,884,766, Cl. 244-3.270.
Army: *See*—
Alving, Carl R.; and Swartz, Glenn M., Jr., 4,885,256, Cl. 436-518.000.
Conway, Thomas G., 4,884,896, Cl. 374-9.000.
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Abbott, Steven R., 4,885,470, Cl. 250-396.00R.
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Reddel, Roger R.; Yang, Ke; Rhim, Johng S.; Brash, Douglas; Su, Robert T.; Lechner, John F.; Gerwin, Brenda I.; Harris, Curtis C.; and Amstad, Paul, 4,885,238, Cl. 435-29.000.
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Alston, William B.; and Gratz, Roy F., 4,885,116, Cl. 562-413.000.
Buck, Gregory M., 4,885,633, Cl. 358-93.000.
Martin, James A., 4,884,770, Cl. 244-158.00R.
Smith, William C., 4,885,543, Cl. 324-452.000.
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Hegedus, Charles R.; and Green, William J., 4,885,324, Cl. 524-204.000.
U.S. Environmental Protection Agency: *See*—
Sparks, Leslie E.; and Plaks, Norman, 4,885,139, Cl. 422-169.000.

U.S. Philips Corp.: *See*—
Bachmann, Peter K.; Geittner, Peter E.; Lydtin, Hans-Jurgen; and Romanowski, Gerd, 4,885,018, Cl. 65-3.110.
Bird, Philip H.; and Armstrong, Desmond R., 4,885,477, Cl. 307-296.800.
Bohm, Heinz, 4,884,868, Cl. 350-168.000.
Boudewijns, Arnoldus J. J., 4,885,552, Cl. 331-1.00A.
Osinski, Kazimierz; and Voors, Ingrid J., 4,885,259, Cl. 437-41.000.
Sluyterman, Albertus A. S.; and Vink, Nicolaas G., 4,885,502, Cl. 313-431.000.
Van Tol, Maurits W.; and Buter, Johannes H. A., 4,885,760, Cl. 378-82.000.

United Technologies Automotive Inc.: *See*—
Vultaggio, Anthony; and Coffin, David A., 4,885,434, Cl. 200-4.000.

United Technologies Corporation: *See*—
Brodell, Robert F.; and Suciu, Gabriel L., 4,884,950, Cl. 416-174.000.
Farina, Joseph P., 4,885,475, Cl. 307-261.000.
LaPrad, Richard F.; and Horan, Gary C., 4,884,397, Cl. 60-39.240.
Novis, Ari M.; Adams, Don L.; LaMontagne, Troy J.; and Sivahop, Albert, 4,885,514, Cl. 318-580.000.
Prewo, Karl M.; Nardone, Vincent C.; and Strife, James R., 4,885,212, Cl. 428-552.000.
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University of British Columbia, The: *See*—
Whitehead, Lorne A.; Clark, Robert L.; and Curzon, Francis L., 4,885,783, Cl. 381-191.000.

University of California, The Regents of the: *See*—
Hoenniger, John C., III; and Hosier, Kenneth E., Jr., 4,885,538, Cl. 324-312.000.
Yao, Ching; Hale, James D.; Crooks, Lawrence E.; and Kaufman, Leon, 4,885,542, Cl. 324-313.000.

University of Connecticut: *See*—
Sung, Chong S. P., 4,885,254, Cl. 436-85.000.

University of Florida: *See*—
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University of Kentucky Research Foundation: *See*—
Hussain, Anwar A.; Dittert, Lewis W.; and Foster, Thomas S., 4,885,287, Cl. 514-159.000.

University of Michigan, The: *See*—
Mountz, James M.; and Wilson, Mark W., 4,884,566, Cl. 128-303.00B.

University of Michigan-Ann Arbor, The: *See*—
Gilgenbach, Ronald M., 4,885,065, Cl. 204-157.600.

University of Minnesota, Regents of the: *See*—
Carey, James R., 4,885,687, Cl. 364-413.020.
Kazerooni, Homayoon, 4,884,941, Cl. 414-744.500.
Warner, Raymond M., Jr.; Schrimpf, Ronald D.; and Tuszynski, Alfons, 4,885,615, Cl. 357-22.000.

University of Queensland: *See*—
Millichip, Robyn J., 4,885,241, Cl. 435-42.000.

University of Utah: *See*—
Stanley, Theodore H.; and Hague, Brian, 4,885,173, Cl. 424-440.000.

University Patents, Inc.: *See*—
Remers, William A., 4,885,304, Cl. 514-338.000.

Uomi, Kazuhisa: *See*—
Okai, Makoto; Uomi, Kazuhisa; Tsuji, Shinji; Sakano, Shinji; and Chinone, Naoki, 4,885,753, Cl. 372-45.000.

UOP: *See*—
Ferk, Don L.; Schmelzer, Eugene; and Haun, Edward C., 4,885,424, Cl. 585-450.000.
Johnson, Susan S.; and Goodman, James R., 4,885,207, Cl. 428-403.000.
Lomas, David A., 4,885,138, Cl. 422-144.000.
Martindale, David C., 4,885,420, Cl. 585-322.000.
Wang, Li, 4,885,422, Cl. 585-419.000.

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Zowarka, Raymond C.; Weeks, Damon A.; Weldon, William F.; Gully, John H.; Upshaw, Jim L.; Spann, Mike L.; and Peterson, Dennis R., 4,884,489, Cl. 89-8.000.

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Urano, Yasuo: *See*—
Ishizaki, Takaharu; Igarashi, Taizo; Urano, Yasuo; and Onodera, Yumiko, 4,885,008, Cl. 44-62.000.

Ury, Michael G.; Matthews, John C.; and Rounds, Stuart N., to Fusion Systems Corporation. Apparatus for photoresist stripping. 4,885,047, Cl. 156-345.000.

Uryu, Toshiyuki; and Nishiguchi, Toshihiko, to Mita Industrial Co., Ltd. Photoconductive material for electrophotography comprising rhodanine derivative charge complex. 4,885,369, Cl. 548-183.000.

Usdin, Vera R.: *See—*
Breuer, Miklos M.; Kaszynski, Edwin G.; Shander, Douglas; Usdin, Vera R.; and van der Lee, Hermes, 4,885,289, Cl. 514-170.000.

USG Interiors, Inc.: *See—*
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Ushikubo, Takashi; Okayama, Hideaki; Kawahara, Masato; and Asabayashi, Issei, to Oki Electric Industry Co., Ltd. Distributed coupler switch. 4,884,858, Cl. 350-96.130.

Utica Enterprises, Inc.: *See—*
Dacey, Ernest A., Jr., 4,884,431, Cl. 72-334.000.

Vaida, Robert M.; Osthus, Harold L.; and Kuchta, Richard, to Gerber Garment Technology, Inc. Transfer slide assembly and system. 4,884,510, Cl. 104-91.000.

Val Products, Inc.: *See—*
Steudler, Frederick W., Jr., 4,884,528, Cl. 119-72.500.

Valsecchi, Enrico: *See—*
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VanDaele, John J.: *See—*
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van Der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N.V. Soil cultivating implements. 4,884,640, Cl. 172-68.000.

Vanderpool, Jack E.: *See—*
Kopatz, Nelson E.; Johnson, Walter A.; Vanderpool, Jack E.; and Shaw, Howard H., 4,885,028, Cl. 75-0.5BB.

Vander Syde, Gary, to Bell & Howell Company. Document feeder apparatus. 4,884,795, Cl. 271-34.000.

Vanderwater, David A., to Hewlett-Packard Company. Method for positioning a crystal ingot. 4,884,887, Cl. 356-31.000.

Van Horn, Mark L, to Motorola, Inc. Load pull isolation switch for a fast locking synthesizer. 4,885,799, Cl. 455-78.000.

Van Niekerk, Johannes W. Twin coil apparatus and energizing structure therefor. 4,884,954, Cl. 417-417.000.

van Perlstein, Erik B.: *See—*
den Hartog, Huibert W.; and van Perlstein, Erik B., 4,885,041, Cl. 148-2.000.

Van Sickle, Robert J., to United Power Corporation. Rotary power module construction. 4,885,492, Cl. 310-113.000.

VanSlyke, Steven A.: *See—*
Tang, Ching W.; and VanSlyke, Steven A., 4,885,211, Cl. 428-457.000.

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Vara, Fulvio J.: *See—*
Dougherty, James A.; and Vara, Fulvio J., 4,885,319, Cl. 522-31.000.

Varga, Ljubomir D.; and Losic, Novica A. Synthesis of load-independent switch-mode power converters. 4,885,674, Cl. 363-21.000.

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Vatne, Rolf S.: *See—*
Buzak, Thomas S.; and Vatne, Rolf S., 4,884,874, Cl. 350-336.000.

Vedove, Walter D., to Solvay & Cie. (Societe Anonyme). Composite sheet for impervious coating of construction components. 4,885,210, Cl. 428-447.000.

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Provost, George A.; and Bahro, Rita T., 4,884,323, Cl. 24-442.000.

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Handler, Michael D., 4,884,713, Cl. 220-23.400.

Ventura, Leon P.; and Diaz-Infante, Javier, to Bud of California. Lettuce packer. 4,884,388, Cl. 53-537.000.

Vercellotti, Leonard C.; Anderson, Arthur A.; Christiansen, David A.; Johnson, Dannis R.; Brickner, Laurence R.; Colclaser III, Robert G.; and Leddy, John G., to Thermo King Corporation. Power line carrier communication system for monitoring refrigerated containers. 4,885,564, Cl. 340-310.00A.

Verhagen, George: *See—*
Harry, John O.; and Verhagen, George, 4,885,072, Cl. 204-279.000.

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Vermaat, David, to Imagitek. Copy turn around mechanism for reproduction machine. 4,884,798, Cl. 271-307.000.

Vermont Castings, Inc.: *See—*
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Verna, Eric: *See—*
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Vespermann, Dieter: *See—*
Lange, Ernst W.; Scholl, Karl; and Vespermann, Dieter, 4,884,708, Cl. 220-3.000.

Veverka, Edward F.; and Hassler, Stephen P., to Cooper Industries, Inc. Transformer overload and fault protection apparatus. 4,885,561, Cl. 337-190.000.

Vezina, Claude: *See—*
Surendra, Sehgal N.; and Vezina, Claude, 4,885,171, Cl. 424-122.000.

Vian, Joel: *See—*
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Victor Company of Japan, Ltd.: *See—*
Tanaka, Koji; Nishikawa, Kazunori; and Yamada, Kazuya, 4,885,750, Cl. 371-37.400.

Vidal, Jean-Charles: *See—*
Blanpain, Roland; Le Masson, Patrick; and Vidal, Jean-Charles, 4,885,536, Cl. 324-207.000.

Vidmar, James F.: *See—*
Sones, Richard A.; Tesic, Mike M.; and Vidmar, James F., 4,885,761, Cl. 378-197.000.

View-Master Ideal Group, Inc.: *See—*
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Villard, Francois: *See—*
Barriquand, Bernard; Villard, Francois; and Durantet, Bernard, 4,884,418, Cl. 68-150.000.

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Vink, Nicolaas G.: *See—*
Sluyterman, Albertus A. S.; and Vink, Nicolaas G., 4,885,502, Cl. 313-431.000.

Vision II Technology Inc.: *See—*
Rabideau, Brian; Laughlin, William D.; Kissman, Kenneth; and Nicowski, Anthony T., 4,885,771, Cl. 379-354.000.

Vistins, Maris, to Becton, Dickinson and Company. Glove having improved cuff securing features. 4,884,300, Cl. 2-162.000.

Vladuchick, William C.: *See—*
Morin, John M., Jr.; and Vladuchick, William C., 4,885,362, Cl. 540-364.000.

Voelz, Fred L.: *See—*
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Voest-Alpine Aktiengesellschaft: *See—*
Wrulich, Herwig; Weissensteiner, Hubert; and Bruns, Bernward, 4,884,848, Cl. 299-73.000.

Vogel, Helmut: *See—*
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Vogt, Robert K.: *See—*
Yu, Thomas C.; Vogt, Robert K.; and Wilkins, John J., 4,884,677, Cl. 198-370.000.

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Volz, Hans: *See—*
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von der Eltz, Hans-Ulrich, to Hoechst Aktiengesellschaft. Process for dyeing textile wovens or knits made of polyester fibers or mixtures thereof with other fibers in jet dyeing machines. 4,884,308, Cl. 8-149.100.

Von Schnakenburg, Joachim: *See—*
Pleschiutschnigg, Fritz-Peter; Von Schnakenburg, Joachim; Parschat, Lothar; and Stadler, Peter, 4,884,624, Cl. 164-454.000.

Voors, Ingrid J.: *See—*
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Wm. Wrigley Jr. Company: *See*—
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Williams, Leon G. Method and means of displaying information. 4,885,575, Cl. 340-712.000.

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Dinatale, Ernest L.; and Roller, George J., 4,884,794, Cl. 271-3.000.
Kuhman, Daniel E.; Jansen, Frank; and Grammatica, Steven J., 4,885,220, Cl. 430-31.000.

Yabe, Hisao, to Olympus Optical Co., Ltd. Endoscope apparatus capable of monochrome display with respect to specific wavelength regions in the visible region. 4,885,634, Cl. 358-98.000.

Yabe, Hisao: *See*—
Kimura, Kenji; Hibino, Hiroki; Nisikori, Toshiaka; Ogiu, Hisao; Kidawara, Atsushi; Yabe, Hisao; Takamura, Koji; Yoshinaga, Jun; Kato, Shinichi; and Nakamura, Takeaki, 4,885,635, Cl. 358-98.000.

Yada, Yukihiko; and Kishio, Toshiaki, to Tokai Kogyo Kabushiki Kaisha. Molding and method of producing the same. 4,884,380, Cl. 52-208.000.

Yagi, Kazuyuki: *See*—
Tanaka, Hideshi; Yagi, Kazuyuki; Tanimoto, Shigeru; Komatsu, Yasuaki; Yanagawa, Koichi; and Kuboyama, Yoichi, 4,885,528, Cl. 324-57.00R.

Yamada, Kazuya: *See*—
Tanaka, Koji; Nishikawa, Kazunori; and Yamada, Kazuya, 4,885,750, Cl. 371-37.400.

Yamada, Nobuo; and Kobayashi, Toyohiko, to Takasago Perfumery Co., Ltd. Perfume composition. 4,885,274, Cl. 512-16.000.

Yamada, Okimasa: *See*—
Sonoi, Takehiro; Sagawa, Toshimasa; Yamada, Okimasa; and Mizuno, Tetsuya, 4,885,398, Cl. 568-404.000.

Yamade, Yasushi: *See*—
Fujita, Masafumi; Yamade, Yasushi; and Saijo, Takao, 4,885,605, Cl. 355-41.000.

Yamagata, Shinji: *See*—
Hisatsune, Fumiyuki; and Yamagata, Shinji, 4,885,441, Cl. 200-144.00R.

Yamagishi, Yutaka; and Takeda, Kenji, to Horiba Ltd. Infrared gas analyzer. 4,885,469, Cl. 250-345.000.

Yamaguchi, Mikio; Watase, Yukihiro; Kambe, Takeshi; and Katou, Susumu, to Kumiai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. Thiadiazabicyclononane derivatives and herbicidal compositions. 4,885,023, Cl. 71-90.000.

Yamaguchi, Morio, to Max, Co., Ltd. Serial printer with a single type wheel. 4,884,906, Cl. 400-162.300.

Yamaguchi, Takahiro; Kasahara, Toshiharu; and Kosawa, Hiromi, to Advantest Corporation. Apparatus and method for measuring frequency response function. 4,885,708, Cl. 364-553.000.

Yamaguchi, Tetsuo: *See*—
Kurimoto, Isao; Yamamoto, Hiroki; and Yamaguchi, Tetsuo, 4,885,322, Cl. 524-82.000.

Yamaha Corporation: *See*—
Nagasaki, Yoichi; Nagamoto, Itsushi; Tadokoro, Toyohiko; and Fujimura, Masaki, 4,884,812, Cl. 273-167.00H.
Suzuki, Kunio; Takamura, Masayuki; and Kubono, Tadashi, 4,884,623, Cl. 164-129.000.

Yamakoshi, Kenichi: *See*—
Watanabe, Yasuo; Yamakoshi, Kenichi; and Shimazu, Hideaki, 4,885,002, Cl. 604-9.000.

Yamamoto, Akira: *See*—
Yoshida, Kinzi; Yamamoto, Akira; and Iura, Kazuo, 4,884,430, Cl. 72-281.000.

Yamamoto, Hiroki: *See*—
Kurimoto, Isao; Yamamoto, Hiroki; and Yamaguchi, Tetsuo, 4,885,322, Cl. 524-82.000.

Yamamoto, Hiroyoshi; Takesue, Toshiharu; and Kawawada, Naoki, to Seiko Instruments Inc. Optical attenuator and manufacturing method for making same. 4,884,859, Cl. 350-96.150.

Yamamoto, Michio; Kiriyama, Tsutomu; Sasaki, Noriaki; Sakamoto, Yoshitaka; and Ishimaru, Kenji, to Teijin Limited. Method for treating synthetic pulp particles, and pulp particles composed of synthetic polymer. 4,885,057, Cl. 162-9.000.

Yamamoto, Soichiro; and Kawata, Ken, to Fuji Photo Film Co., Ltd. Light-sensitive material containing silver halide, reducing agent, polymerizable compound and a decolorizable dye. 4,885,224, Cl. 430-138.000.

Yamamoto, Taizo; and Konishi, Hirokazu, to Nippon Elanco Kabushiki Kaisha. Apparatus for filling granular substance into hard gelatin capsules. 4,884,602, Cl. 141-242.000.

Yamamoto, Takashi: *See*—
Okai, Toshihiro; Okumura, Yoshiaki; Oda, Mitsuyuki; Yamamoto, Takashi; and Kuwajima, Teruaki, 4,885,032, Cl. 75-251.000.

Yamamoto, Takeshi: *See*—
Hashimoto, Masanori; Yamamoto, Takeshi; Kawachi, Toru; Kuwashima, Junji; and Kitaoka, Hirokazu, 4,885,168, Cl. 424-95.000.

Yamamoto, Yoko: *See*—
Kaneko, Tadashi; Shirose, Meizo; and Yamamoto, Yoko, 4,885,222, Cl. 430-102.000.

Yamamoto, Yoshiaki: *See*—
Fujita, Yoshitada; Hanada, Sadashi; and Yamamoto, Yoshiaki, 4,884,938, Cl. 414-541.000.

Yamamoto, Yoshimi, to Fujikiko Kabushiki Kaisha. Attachment structure of a steering column. 4,884,778, Cl. 248-548.000.

Yamamura, Masaaki; Inokoshi, Junichi; Ito, Tetuo; Furuta, Kazumitsu; and Shimizu, Kazuo, to Kao Corporation. Cloth-softening liquid composition containing quaternary ammonium compound and a polyether derivative or cationic surfactant polymer. 4,885,102, Cl. 252-8.800.

Yamamuro, Shinichi: *See*—
Muramatsu, Tadao; Hoshino, Shigeru; Suzuki, Kenichi; and Yamamuro, Shinichi, 4,884,468, Cl. 74-502.400.

Yamane, Yasuaki, to Hitachi, Ltd. Method and apparatus for partial test-cause generation. 4,885,712, Cl. 364-580.000.

Yamanishi, Masaji: *See*—
Sotoya, Kohshiro; Kubo, Makoto; Okabe, Kazuhiko; Tanigaki, Masanobu; Yamanishi, Masaji; and Hirota, Hajime, 4,885,112, Cl. 252-352.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
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Yamashita, Hiroshi; and Muto, Kenkichi, to Ricoh Company, Ltd. Method of producing polymer particles having narrow particle size distribution. 4,885,350, Cl. 526-201.000.

Yamashita, Hisao: *See*—
Miyamoto, Tomohiko; Koyama, Shuntaro; Tomuro, Jinichi; Morihara, Atsushi; Yamashita, Hisao; Takahashi, Sadao; Kida, Eiji; Ueda, Akio; and Takamoto, Shigehito, 4,884,396, Cl. 60-39.120.

Yamazi, Satoru: *See*—
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Yanagawa, Koichi: *See*—
Tanaka, Hideshi; Yagi, Kazuyuki; Tanimoto, Shigeru; Komatsu, Yasuaki; Yanagawa, Koichi; and Kuboyama, Yoichi, 4,885,528, Cl. 324-57.00R.

Yanagen Company Ltd.: *See*—
Yanagida, Satoshi, 4,884,554, Cl. 126-21.00R.

Yanagida, Satoshi, to Yanagen Company Ltd. Spit roaster. 4,884,554, Cl. 126-21.00R.

Yanagisawa, Yasushi: *See*—
Odagawa, Yoshimoto; and Yanagisawa, Yasushi, 4,885,535, Cl. 324-207.000.

Yanagishima, Fumiya: *See*—
Kenmochi, Kazuhito; Fukuhara, Akihiko; Komatu, Tomio; Kitahama, Masanori; Abe, Hideo; Kishida, Akira; Yanagishima, Fumiya; and Kobayashi, Makoto, 4,885,042, Cl. 148-12.00E.

Yang, Chihae; and Kaufmann, Edward J., to Clorox Company, The. Films from PVA modified with nonhydrolyzable anionic comonomers. 4,885,105, Cl. 252-90.000.

Yang, Ke: *See*—
Reddel, Roger R.; Yang, Ke; Rhim, Johng S.; Brash, Douglas; Su, Robert T.; Lechner, John F.; Gerwin, Brenda I.; Harris, Curtis C.; and Amstad, Paul, 4,885,238, Cl. 435-29.000.

Yano, Takashi, to Ricoh Company, Ltd. Node apparatus and communication network. 4,885,742, Cl. 370-85.200.

Yao, Ching; Hale, James D.; Crooks, Lawrence E.; and Kaufman, Leon, to University of California, The Regents of the. MRI compen-

sated for spurious NMR frequency/phase shifts caused by spurious changes in magnetic fields during NMR data measurement processes. 4,885,542, Cl. 324-313.000.

Yao, Chung-Niang: *See*—
Lee, Lain-tze; Chen, Mei H.; and Yao, Chung-Niang, 4,885,389, Cl. 564-418.000.

Yao, Raymond C.: *See*—
Hamill, Robert L.; and Yao, Raymond C., 4,885,170, Cl. 424-117.000.

Yasu, Minako: *See*—
Miyake, Miyuki; Toda, Haruhiko; and Yasu, Minako, 4,885,159, Cl. 424-70.000.

Yasuda, Tomio: *See*—
Aoki, Kohji; Yasuda, Tomio; Masanori, Sugiyama; and Osamu, Komazawa, 4,885,566, Cl. 340-457.100.

Yasui, Toshihiko, to Shimano Industrial Company Limited. Fishing rod. 4,884,356, Cl. 43-23.000.

Yasukawa, Takeshi: *See*—
Onishi, Masayoshi; Naitou, Yasuo; and Yasukawa, Takeshi, 4,884,649, Cl. 180-179.000.

Yasumi, Yoshiyuki, to Alps Electric Co., Ltd. Mechanism for shifting the track position of a multi-track ink ribbon in a printer. 4,884,907, Cl. 400-216.100.

Yasunaga, Tadashi; and Shirahata, Ryuji, to Fuji Photo Film Co., Ltd. Method of producing magnetic recording media. 4,885,189, Cl. 427-129.000.

Yasunori, Yukio: *See*—
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, 4,885,125, Cl. 264-328.600.

Yasuoka, Norio; Kobayashi, Takehiro; Hikida, Nobuharu; Hatakeyama, Yasuyuki; Aoto, Yoshiyuki; and Itogawa, Jiro, to Sharp Kabushiki Kaisha. Remote control device using a telephone line. 4,885,766, Cl. 379-105.000.

Yato, Yoshiaki: *See*—
Fukushima, Takeo; Mizuguchi, Masami; Furukawa, Takahiro; Yato, Yoshiaki; Sato, Kenji; Fujimoto, Naonobu; and Murase, Tetsuro, 4,885,746, Cl. 370-102.000.

Yazaki Corporation: *See*—
Inaba, Shigemitsu; Ootaka, Kazuto; and Maeda, Akira, 4,884,978, Cl. 439-352.000.

Yoder, Douglas J.; Brown, Ronald E.; Stevenson, Paul E.; Hornback, Donald L.; and Leisure, Ronald K., to Delco Electronics Corporation. Monolithic pressure sensitive integrated circuit. 4,885,621, Cl. 357-26.000.

Yokohama Rubber Co., Ltd., The: *See*—
Mori, Shinichi, 4,884,607, Cl. 152-209.00R.

Yokotani, Yoichiro; Kagata, Hiroshi; Niwa, Hiroshi; Kato, Junichi; and Mihara, Toshihiro, to Matsushita Electric Industrial Co., Ltd. Multilayer ceramic capacitor. 4,885,661, Cl. 361-321.000.

Yokote, Sachio: *See*—
Kawai, Yoichi; Udagawa, Takatoshi; Imakita, Takeshi; and Yokote, Sachio, 4,885,162, Cl. 424-83.000.

Yokoyama, Bungo, to Westinghouse Electric Corp. Nuclear fuel rod support grid with attachable spring and dimple support spacers. 4,885,127, Cl. 376-462.000.

Yokoyama, Yutaka; and Shinozaki, Fumihiko, to Nippon Chemi-Con Corporation. Liquid electrolyte for use in electrolytic capacitor. 4,885,115, Cl. 252-62.200.

Yoneda, Takao: *See*—
Suzuki, Ikuo; Yoneda, Takao; Hotta, Takayuki; and Yonezu, Toshihiro, 4,884,373, Cl. 51-165.710.

Yonezu, Toshihiro: *See*—
Suzuki, Ikuo; Yoneda, Takao; Hotta, Takayuki; and Yonezu, Toshihiro, 4,884,373, Cl. 51-165.710.

Yoshida Industry Co., Ltd.: *See*—
Hatakeyama, Yoshiharu; and Ishiguro, Mitsuo, 4,884,601, Cl. 141-71.000.

Yoshida, Kinzi; Yamamoto, Akira; and Iura, Kazuo, to Sumitomo Wiring Systems, Ltd. Filament drawing machine. 4,884,430, Cl. 72-281.000.

Yoshida Kogyo K. K.: *See*—
Komori, Akihiro; and Hirano, Muneyoshi, 4,884,613, Cl. 160-107.000.

Yoshida, Masao: *See*—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,885,644, Cl. 358-342.000.

Yoshida, Naruhito: *See*—
Egawa, Jiro; Yoshida, Naruhito; Kasai, Toshihiro; Nagasawa, Moriya; Ide, Naoaki; and Machida, Hironobu, 4,885,596, Cl. 346-157.000.

Yoshida, Takehiro, to Canon Kabushiki Kaisha. Method and apparatus for data communication. 4,885,755, Cl. 375-58.000.

Yoshigi, Hiroshi: *See*—
Fukinuki, Takahiko; Hirano, Yasuhiro; Yoshigi, Hiroshi; and Jusa, Hidehiko, 4,885,631, Cl. 358-21.00R.

Yoshikawa, Hiromichi; and Misumi, Teruyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Phosphonamidothionate derivatives and their use as pesticides. 4,885,286, Cl. 514-120.000.

Yoshikawa, Kensei; Ohuchi, Yutaka; Sekiuchi, Kazuto; Saito, Shiuji; Hatayama, Katsuo; and Sota, Kaoru, to Taisho Pharmaceutical Co., Ltd. Sulfonanilide compounds. 4,885,367, Cl. 546-216.000.

Yoshikawa, Kuniyoshi, to Kabushiki Kaisha Toshiba. Method for isolating a semiconductor element. 4,885,261, Cl. 437-228.000.

Yoshimura, Toshio, to Tanashin Denki Co., Ltd. Cassette tape recorder having a tape cassette ejector and head shifter with common drive mechanism. 4,885,648, Cl. 360-96.500.

Yoshinaga, Jun: *See*—
Kimura, Kenji; Hibino, Hiroki; Nisikori, Toshiaka; Ogiu, Hisao; Kidawara, Atsushi; Yabe, Hisao; Takamura, Koji; Yoshinaga, Jun; Kato, Shinichi; and Nakamura, Takeaki, 4,885,635, Cl. 358-98.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Iizuka, Takao; and Ota, Akiho, 4,884,961, Cl. 425-195.000.

Yoshio, Junichi: *See*—
Ishii, Hidehiro; Yoshio, Junichi; Watanabe, Osamu; Izumo, Takeshi; Takeya, Noriyoshi; Katakami, Kazuhiko; Shinohara, Masayori; and Yoshida, Masao, 4,885,644, Cl. 358-342.000.

Yoshioka, Keiichi; Watanabe, Kenji; and Kato, Yasushi, to Kawasaki Steel Corp. Zn-coated stainless steel welded pipe. 4,885,215, Cl. 428-632.000.

Yoshitake, Akira: *See*—
Nakatsuka, Iwao; Okuno, Masami; Shiba, Kunio; and Yoshitake, Akira, 4,885,152, Cl. 424-1.100.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Gohbayashi, Masayoshi; Narita, Noritsugu; and Maruno, Makoto, 4,885,382, Cl. 560-75.000.

Yoshiura, Shoichiro, to Sharp Kabushiki Kaisha. Image reading apparatus. 4,885,640, Cl. 358-400.000.

Young, Donald C., to Union Oil Company of California. Alkylation. 4,885,425, Cl. 585-458.000.

Young, Lydia J., to Perkin-Elmer Corporation, The. Silicon grid as a reference and calibration standard in a particle beam lithography system. 4,885,472, Cl. 250-491.100.

Yu, Chen-Tsung. Touchably-operating miniature flashlight. 4,885,666, Cl. 362-189.000.

Yu, Thomas C.; Vogt, Robert K.; and Wilkins, John J., to Buschman Company, The. Package sortation conveyor. 4,884,677, Cl. 198-370.000.

Yui, Yasuji, to Sony Corporation. Apparatus for developing imaging sheets employing photosensitive microcapsules. 4,885,601, Cl. 355-27.000.

Yura, Fumitoshi: *See*—
Takeyasu, Hatsuichi; Sakata, Kenichi; and Yura, Fumitoshi, 4,884,856, Cl. 350-6.800.

Yuugenkaisha Ohnobankinkougyousho: *See*—
Hashimoto, Nobuo; Ishii, Hideo; Tanahashi, Kenji; Ohno, Kenji; and Ohno, Kiichi, 4,884,894, Cl. 366-338.000.

Yuyama, Masahiro: *See*—
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, 4,885,125, Cl. 264-328.600.

Yuzo, Ono, to NEC Corporation. Diffraction grating using birefringence and optical head in which a linearly polarized beam is directed to a diffraction grating. 4,885,734, Cl. 369-45.000.

Zachystal, George J. Device for obtaining a directional centrifugal force. 4,884,465, Cl. 74-84.00R.

Zafiropoulo, Arthur W.: *See*—
Maher, Joseph A.; Vowles, E. John; Napoli, Joseph D.; Zafiropoulo, Arthur W.; and Miller, Mark W., 4,885,050, Cl. 156-345.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Ehrlinger, Friedrich, 4,884,669, Cl. 192-4.00B.

Zambias, Robert A. Anti-theft device for automobile audio equipment. 4,884,646, Cl. 180-90.000.

Zaracki, Stanley J.: *See*—
Daggett, Walter E.; and Zaracki, Stanley J., 4,884,471, Cl. 74-758.000.

Zavracky, Paul M.: *See*—
Fan, John C. C.; Zavracky, Paul M.; Narayan, Jagdish; Allen, Lisa P.; and Vu, Duy-Phach, 4,885,052, Cl. 156-620.700.

Zdrahala, Richard J.: *See*—
Karakelle, Mutlu; and Zdrahala, Richard J., 4,885,077, Cl. 204-403.000.

Zeets, Joseph S.: *See*—
Powers, Richard G.; Currier, Joseph G.; and Zeets, Joseph S., 4,884,594, Cl. 137-625.480.

Zeiffer, Dieter F.; and Junkins, George M., to Gaston County Dyeing Machine Co. Method and apparatus for generating and dispersing immiscible liquid particles in a carrier liquid and dispensing said carrier liquid. 4,884,893, Cl. 366-176.000.

Zell, Karl: *See*—
Pelzl, Leo; Seidel, Peter; and Zell, Karl, 4,884,975, Cl. 439-78.000.

Zeller, Rudolf; and Kitzsteiner, Friedrich, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Testing device and method of determining the uncertainty of measurement of coordinate-measuring instruments. 4,884,348, Cl. 33-502.000.

Zengerle, Paul L., to Eastman Kodak Company. Photographic materials containing stable cyan coupler formulations. 4,885,234, Cl. 430-546.000.

Zenith Electronics Corporation: *See*—
Citta, Richard W.; Long, Michael E.; and Mutzabaugh, Dennis M., 4,885,776, Cl. 380-15.000.
Konopka, John G., 4,885,522, Cl. 320-21.000.
Matthews, Lloyd E., 4,885,510, Cl. 315-411.000.
Sgrignoli, Gary J., 4,885,794, Cl. 455-5.000.
Tong, Hua Sou, 4,885,501, Cl. 313-402.000.

Zhaorong, Lin: *See*—
En-Jian, Chen; Zhaorong, Lin; and Ly-ying, Chen, 4,884,628, Cl. 165-104.270.

Zhuxian, Qiu: *See*—
Guangchun, Yao; Zhuxian, Qiu; and Wu, Nu Z., 4,885,073, Cl. 204-291.000.

Zibell, Steven E., to Wm. Wrigley Jr. Company. Method of making chewing gum with wax-coated delayed release ingredients. 4,885,175, Cl. 426-5.000.

Zibold, Karl: *See*—
Konrath, Karl; Koester, Claus; Zibold, Karl; Schwarz, Manfred; Russeler, Karl-Friedrich; Krieger, Klaus; and Kupzik, Roland, 4,884,542, Cl. 123-370.000.

Ziegler, Peter: *See*—
Lenz, Rudiger; Walz, Gerd; Honel, Michael; and Ziegler, Peter, 4,885,392, Cl. 564-503.000.

Zilog, Inc.: *See*—
Dalrymple, Monte J., 4,885,584, Cl. 341-101.000.

Zimmermann, Rudolf: *See*—
Behrens, Dietmar; Hoog, Waldemar; and Zimmermann, Rudolf, 4,884,691, Cl. 206-444.000.

Zoni, Sergio, to Dulevo S.p.A. Street sweeper machine with trash pick-up and transport capabilities. 4,884,313, Cl. 15-340.300.

Zowarka, Raymond C.; Weeks, Damon A.; Weldon, William F.; Gully, John H.; Upshaw, Jim L.; Spann, Mike L.; and Peterson, Dennis R., to Board of Regents University of Texas System. High performance electromagnetic railgun launcher. 4,884,489, Cl. 89-8.000.

Zupancic, Joseph J.: *See*—
Swedo, Raymond J.; and Zupancic, Joseph J., 4,885,091, Cl. 210-500.370.

Zweighaft, James, to Storage Technology Corporation. Control loop instability detection and correction apparatus. 4,885,676, Cl. 364-178.000.

Zwick, Maurice M., to American Cyanamid. Process for the manufacture of asymmetric, porous membranes and product thereof. 4,885,092, Cl. 210-500.410.

Zyma SA: *See*—
Rimbault, Christian G., 4,885,298, Cl. 514-253.000.

392534 Alberta Ltd.: *See*—
Wawrzynowski, Mike; and Ruckman, Don, 4,884,643, Cl. 175-74.000.

501 Bio-Research Laboratories, Inc.: *See*—
Osther, Kurt B.; and Dyll, Louis M., 4,885,235, Cl. 435-5.000.

501 Daicel Chemical Industries Ltd.: *See*—
Takenaka, Fumio; Tohya, Kouzi; and Ohtsuka, Yoshihiro, 4,885,229, Cl. 430-285.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF DECEMBER, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Campbell, Henry F.; Scholtz, Thomas H.; and Douglas, George H., to Rorer Pharmaceutical Corporation. 3- and 5-[3-(1-arylureido)]-1,2,4-triazoles. Re. 33,125, Cl. 514-383.000.

Corsetti, John A., to Johnson, Dennis L. Lamp socket. Re. 33,123, Cl. 439-628.000.

Douglas, George H.: *See*—
Campbell, Henry F.; Scholtz, Thomas H.; and Douglas, George H., Re. 33,125, Cl. 514-383.000.

Johnson, Dennis L.: *See*—
Corsetti, John A., Re. 33,123, Cl. 439-628.000.

Mobil Oil Corporation: *See*—
Orem, William G., Re. 33,122, Cl. 53-459.000.

Orem, William G., to Mobil Oil Corporation. Apparatus for loading bags. Re. 33,122, Cl. 53-459.000.

Rorer Pharmaceutical Corporation: *See*—
Campbell, Henry F.; Scholtz, Thomas H.; and Douglas, George H., Re. 33,125, Cl. 514-383.000.

Scholtz, Thomas H.: *See*—
Campbell, Henry F.; Scholtz, Thomas H.; and Douglas, George H., Re. 33,125, Cl. 514-383.000.

Singer, Haimi N., to Singer and Hersch Industrial Development (PTY) Ltd. Water-based industrial fluids. Re. 33,124, Cl. 252-18.000.

Singer and Hersch Industrial Development (PTY) Ltd.: *See*—
Singer, Haimi N., Re. 33,124, Cl. 252-18.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Dentsply Research Development Corp.: *See*—
Dougherty, Emery W.; and Welsh, Richard E., B1 4,330,280, Cl. 433-90.000.

Dougherty, Emery W.; and Welsh, Richard E., to Dentsply Research Development Corp. Ejector holder for capsule-like cartridge. B1 4,330,280, 12-5-89, Cl. 433-90.000.

Ferraro, Frank A., to Warner-Lambert Company. Blade assembly featuring variable span. B1 4,709,477, 12-5-89, Cl. 30-50.000.

Grizzle, Glen; Tyler, Stephen L.; and Walto, Joseph J., to Toro Company, The. Adjustable arc sprinkler head. B1 4,634,052, 12-5-89, Cl. 239-205.000.

Irlinger, Frank S.: *See*—
Vago, Otto Z.; and Irlinger, Frank S., B1 4,250,759, Cl. 73-273.000.

Schrader Automotive, Inc.: *See*—
Vago, Otto Z.; and Irlinger, Frank S., B1 4,250,759, Cl. 73-273.000.

Toro Company, The: *See*—
Grizzle, Glen; Tyler, Stephen L.; and Walto, Joseph J., B1 4,634,052, Cl. 239-205.000.

Tyler, Stephen L.: *See*—
Grizzle, Glen; Tyler, Stephen L.; and Walto, Joseph J., B1 4,634,052, Cl. 239-205.000.

Vago, Otto Z.; and Irlinger, Frank S., to Schrader Automotive, Inc. Digital readout. B1 4,250,759, 12-5-89, Cl. 73-273.000.

Walto, Joseph J.: *See*—
Grizzle, Glen; Tyler, Stephen L.; and Walto, Joseph J., B1 4,634,052, Cl. 239-205.000.

Warner-Lambert Company: *See*—
Ferraro, Frank A., B1 4,709,477, Cl. 30-50.000.

Welsh, Richard E.: *See*—
Dougherty, Emery W.; and Welsh, Richard E., B1 4,330,280, Cl. 433-90.000.

LIST OF DESIGN PATENTEES

Ackeret, Peter, to Licinvest AG. Picture viewer. 304,884, 12-5-89, Cl. D6-311.000.

Arrow Specialty Company: *See*—
Davis, Thomas L.; and Harper, Roy A., 304,948, Cl. D15-5.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Koshino, Susumu, 304,934, Cl. D14-107.000.

Associated Mills Inc.: *See*—
Heiligenstein, Luc, 304,974, Cl. D24-41.000.

Bates Manufacturing Company: *See*—
Leszczak, John; Staubitz, Robert B.; and Valls, William H., 304,903, Cl. D8-50.000.

Baxter, James A., to Chromacol Limited. Vial support sleeve. 304,972, 12-5-89, Cl. D24-29.000.

Baxter, James A., to Chromacol Limited. Vial support sleeve. 304,973, 12-5-89, Cl. D24-29.000.

Behringer, John W. Radio receiver. 304,944, 12-5-89, Cl. D14-188.000.

Bench, Ronald W.; and Duell, Richard J., to Carrier Corporation. Electronic control module enclosure. 304,929, 12-5-89, Cl. D13-12.000.

Benson, Mark W. Baby bib. 304,875, 12-5-89, Cl. D2-226.000.

Bentz Metal Products, Company, Inc.: *See*—
Bentz, Richard A., 304,915, Cl. D12-96.000.

Bentz, Richard A., to Bentz Metal Products, Company, Inc. Sleeper cab for cargo trucks. 304,915, 12-5-89, Cl. D12-96.000.

Bevilacqua, Romolo A. Barbecue grill cleaner. 304,892, 12-5-89, Cl. D7-99.000.

Bleske, Randy J.: *See*—
Muller, Peter H.; Lowe, Peter E.; and Bleske, Randy J., 304,935, Cl. D14-107.000.

Muller, Peter H.; Lowe, Peter E.; and Bleske, Randy J., 304,936, Cl. D14-107.000.

Borromeo, Lucio, to 3T S.p.A. Combined nutcracker and bottle opener. 304,891, 12-5-89, Cl. D7-98.000.

Brawner, William H.; and Tiedge, Walter H. Combination wrench and screwdriver for skateboards. 304,898, 12-5-89, Cl. D8-26.000.

Bridgestone/Firestone, Inc.: *See*—
Hinrichsen, Silvana, 304,917, Cl. D12-146.000.
Hinrichsen, Silvana, 304,918, Cl. D12-146.000.
Hinrichsen, Silvana, 304,919, Cl. D12-147.000.

Brown, Paul D.; and Diaz, Juan A., to Reebok International Ltd. Shoe upper. 304,876, 12-5-89, Cl. D2-314.000.

Canaan, Curtis B. Beverage container holder or similar article. 304,890, 12-5-89, Cl. D7-70.000.

Canon Kabushiki Kaisha: *See*—
Kojima, Tatsuo, 304,951, Cl. D16-223.000.
Omino, Seiichi; and Katayanagi, Jun, 304,956, Cl. D18-22.000.
Sakuta, Kazuaki, 304,937, Cl. D14-109.000.

Carlson, Arthur R. Divider. 304,887, 12-5-89, Cl. D6-509.000.

Carlson, Arthur R., to Decor Corporation Proprietary Limited, The. Potato masher. 304,894, 12-5-89, Cl. D7-101.000.

Carrier Corporation: *See*—
Bench, Ronald W.; and Duell, Richard J., 304,929, Cl. D13-12.000.

Cassells, Alan C.; and Rynhart, Alan D. Controlled environment chamber for plant propagation, biological testing or the like. 304,913, 12-5-89, Cl. D11-145.000.

Castagna, John F., to Sparkomatic Corporation. Bug and stone deflector shield mount for automobiles and the like. 304,921, 12-5-89, Cl. D12-190.000.

Ching, Larry K. W., Jr., to Gates Energy Products, Inc. Battery. 304,926, 12-5-89, Cl. D13-8.000.
Ching, Larry K. W., Jr.; and Puester, Neil, to Gates Energy Products, Inc. Battery. 304,927, 12-5-89, Cl. D13-8.000.
Chromacol Limited: *See—*
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Baxter, James A., 304,973, Cl. D24-29.000.
Chromcraft Furniture Corporation: *See—*
Murry, Edsel E., 304,886, Cl. D6-379.000.
Wilson, Robert L., 304,885, Cl. D6-379.000.
Chuo Kagaku Kabushiki Kaisha: *See—*
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Natori, Eiji, 304,909, Cl. D9-423.000.
Natori, Eiji, 304,910, Cl. D9-423.000.
Cinram Ltd./Ltee.: *See—*
Philosophe, Isidore, 304,880, Cl. D3-35.000.
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Dart Industries Inc.: *See—*
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Davis, Thomas L.; and Harper, Roy A., to Arrow Specialty Company. Carburetor float bowl adapter for use in oilfield pumping equipment. 304,948, 12-5-89, Cl. D15-5.000.
Decor Corporation Proprietary Limited, The: *See—*
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Diaz, Juan A.: *See—*
Brown, Paul D.; and Diaz, Juan A., 304,876, Cl. D2-314.000.
Diversified Visual Techniques, Inc.: *See—*
Lowe, John J.; Stipe, Robert L.; and Fujii, Alan J., 304,938, Cl. D14-121.000.
Double R Enterprises: *See—*
Panella, Roger C., 304,906, Cl. D9-383.000.
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Ebihara, Yoshiyuki. Office stapler. 304,902, 12-5-89, Cl. D8-50.000.
Eppenbach, Lawrence C. Tent. 304,966, 12-5-89, Cl. D21-253.000.
Eubanks, Steven. Corn silker. 304,896, 12-5-89, Cl. D7-369.000.
Evets Corporation: *See—*
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Ridinger, Stephen T.; and Orr, Russell E., II, 304,954, Cl. D17-20.000.
Fairchild Industries, Inc.: *See—*
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Rosenthal, Gordon, 304,925, Cl. D12-331.000.
Fan, Max C. F., to Ping, Chan Cheong; Wan, Chan Cheong; and Haykwan, Chan. Brush for cleaning clothing and other textiles. 304,883, 12-5-89, Cl. D4-137.000.
Fletcher-Terry Company, The: *See—*
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Fontaine Industries, Inc.: *See—*
Klumpp, Harry R., 304,967, Cl. D22-110.000.
Frontline Technology, Inc.: *See—*
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Fukunaga, Masataka: *See—*
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Gates Energy Products, Inc.: *See—*
Ching, Larry K. W., Jr., 304,926, Cl. D13-8.000.
Ching, Larry K. W., Jr.; and Puester, Neil, 304,927, Cl. D13-8.000.
Gibb, Robert F. Bicycle tire inflator. 304,970, 12-5-89, Cl. D23-231.000.
Giungo, John L.; Roseman, Keith; and McNutt, Paul B., to McNutt, Paul B. Game paddle. 304,965, 12-5-89, Cl. D21-213.000.
Grise , Frederick G. J.: *See—*
Grise , Wink; and Grise , Frederick G. J., 304,895, Cl. D7-148.000.
Grise , Wink; and Grise , Frederick G. J. Combined knife and fork. 304,895, 12-5-89, Cl. D7-148.000.
Guillet, Henri. Eyeglasses for make-up application. 304,950, 12-5-89, Cl. D16-102.000.
Gutierrez, Mario B. File clip. 304,958, 12-5-89, Cl. D19-65.000.
Hara, Masaki; Shiratani, Sadao; Sawatani, Masaharu; and Fukunaga, Masataka, to Mitsubishi Denki Kabushiki Kaisha. Operation and control unit for a computer. 304,931, 12-5-89, Cl. D14-100.000.
Harper, Roy A.: *See—*
Davis, Thomas L.; and Harper, Roy A., 304,948, Cl. D15-5.000.
Hasegawa, Sigeru: *See—*
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Heiligenstein, Luc, to Associated Mills Inc. Massager. 304,974, 12-5-89, Cl. D24-41.000.
Hinrichsen, Silvana, to Bridgestone/Firestone, Inc. Tire for vehicle. 304,917, 12-5-89, Cl. D12-146.000.
Hinrichsen, Silvana, to Bridgestone/Firestone, Inc. Tire for vehicle. 304,918, 12-5-89, Cl. D12-146.000.
Hinrichsen, Silvana, to Bridgestone/Firestone, Inc. Tire for vehicle. 304,919, 12-5-89, Cl. D12-147.000.
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Holzman, Robert P., to Poulsen-Cascade Corporation. Shrimp jig with spinner. 304,969, 12-5-89, Cl. D22-129.000.
Hongo, Miyoji; and Yonetsu, Katsumi, to Seiko Instruments & Electronics Ltd. Portable data input terminal. 304,930, 12-5-89, Cl. D14-100.000.
Interplex Electronics,Inc.: *See—*
Melone, Robert A., 304,957, Cl. D19-62.000.
Isotechnologies, Inc.: *See—*
McIntyre, Donald R.; and Miles, James E., 304,964, Cl. D21-195.000.
Ito, Masafumi; Hasegawa, Sigeru; Takita, Haruki; and Sube, Minoru, to TEAC Corporation. Compact disc player. 304,941, 12-5-89, Cl. D14-156.000.
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Kawaguchi, Yoshi. Shoulder bag strap. 304,882, 12-5-89, Cl. D3-54.000.
Kennametal Inc.: *See—*
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Kercher, Russell F. Closet hanger rod connector. 304,904, 12-5-89, Cl. D8-380.000.
King, Feather W. Rectangular holder for small metallic objects. 304,959, 12-5-89, Cl. D19-75.000.
Kirby, Bruce. Sailboat hull. 304,922, 12-5-89, Cl. D12-303.000.
Klumpp, Harry R., to Fontaine Industries, Inc. Telescopic sight mount. 304,967, 12-5-89, Cl. D22-110.000.
Kojima, Tatsuo, to Canon Kabushiki Kaisha. Microfilm reader printer. 304,951, 12-5-89, Cl. D16-223.000.
Korpijaako, E. Pekka, to Willette Corporation, The. Soap shelf. 304,888, 12-5-89, Cl. D6-574.000.
Koshino, Susumu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Image scanner. 304,934, 12-5-89, Cl. D14-107.000.
Kosugi, Yuhei; and Minowa, Yoshio, to NEC Corporation. Transmission and reception unit for a mini earth station. 304,945, 12-5-89, Cl. D14-231.000.
Kozyrski, Vincent T.; and Peters, Alan R., to Fletcher-Terry Company, The. Point driver. 304,901, 12-5-89, Cl. D8-49.000.
Leszczak, John; Staubitz, Robert B.; and Valls, William H., to Bates Manufacturing Company. Stapler. 304,903, 12-5-89, Cl. D8-50.000.
Licinvest AG: *See—*
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Liu, Chin-Lang. Multi-functional wrench. 304,899, 12-5-89, Cl. D8-23.000.
Lowe, John J.; Stipe, Robert L.; and Fujii, Alan J., to Diversified Visual Techniques, Inc. Lightweight magnetic tape cassette. 304,938, 12-5-89, Cl. D14-121.000.
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Mize, Max D. Battery contact clamp for jumper cable. 304,928, 12-5-89, Cl. D13-10.000.
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Muller, Peter H.; Lowe, Peter E.; and Bleske, Randy J., to Hayes Microcomputer Products, Inc. Modem or similar article. 304,936, 12-5-89, Cl. D14-107.000.
Murry, Edsel E., to Chromcraft Furniture Corporation. Seat. 304,886, 12-5-89, Cl. D6-379.000.
Natori, Eiji, to Chuo Kagaku Kabushiki Kaisha. Packaging container. 304,908, 12-5-89, Cl. D9-423.000.
Natori, Eiji, to Chuo Kagaku Kabushiki Kaisha. Packaging container. 304,909, 12-5-89, Cl. D9-423.000.
Natori, Eiji, to Chuo Kagaku Kabushiki Kaisha. Packaging container. 304,910, 12-5-89, Cl. D9-423.000.
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Niebauer, Kenneth L., to Kennametal Inc. Cutting tool insert. 304,949, 12-5-89, Cl. D15-139.000.
Ogawa, Shigeo; and Minowa, Yoshio, to NEC Corporation. Transmitter and receiver for microwave communications. 304,946, 12-5-89, Cl. D14-231.000.
Omino, Seiichi; and Katayanagi, Jun, to Canon Kabushiki Kaisha. Paper feeder for printer. 304,956, 12-5-89, Cl. D18-22.000.
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Oura, Takao; and Hata, Nobuo, to Mitsubishi Denka Kabushiki Kaisha. Combined computer display terminal and telephone. 304,932, 12-5-89, Cl. D14-101.000.
Pado, John T., to Underwater Systems Australia Limited. Underwater vehicle. 304,923, 12-5-89, Cl. D12-308.000.
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Parker, Jeffrey L.; and Parker, Edward, 304,911, Cl. D10-60.000.
Parker, Jeffrey L.; and Parker, Edward, to Parker Electronics, Inc. Thermostat housing or the like. 304,911, 12-5-89, Cl. D10-60.000.
Persson, Bjorn O. H. Watertight accessory container. 304,878, 12-5-89, Cl. D3-30.100.
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Pfeifer, Herbert; Montgomery, Paul; and Sturges, Dan, to Samsung Electronics Co., Ltd. Combination telecommunication set. 304,940, 12-5-89, Cl. D14-151.000.
Philosophe, Isidore, to Cinram Ltd./Ltee. Storage unit. 304,880, 12-5-89, Cl. D3-35.000.
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Ridinger, Stephen T.; and Orr, Russell E., II, to Evets Corporation. Guitar headstock. 304,953, 12-5-89, Cl. D17-20.000.
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Rosenthal, Gordon, to Fairchild Industries, Inc. Aircraft. 304,925, 12-5-89, Cl. D12-331.000.
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Saunders, Stuart D. Combined stereo radio and tape player/recorder. 304,943, 12-5-89, Cl. D14-162.000.
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Scaggs, Robert E. Cooking utensil. 304,893, 12-5-89, Cl. D7-99.000.
Schifrin, Arthur. Combined rear view mirror, clock and radio. 304,920, 12-5-89, Cl. D12-188.000.
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Wan, Chan Cheong: *See—*
Fan, Max C. F., 304,883, Cl. D4-137.000.
Watanabe, Makiko, to Tomy Company, Ltd. Toy robot. 304,962, 12-5-89, Cl. D21-150.000.
Weiland, Herbert C., to Clover Toys, Inc. Toy construction element. 304,961, 12-5-89, Cl. D21-108.000.
Willette Corporation, The: *See—*
Korpijaako, E. Pekka, 304,888, Cl. D6-574.000.
Wilson, Robert L., to Chromcraft Furniture Corporation. Seat. 304,885, 12-5-89, Cl. D6-379.000.
Winter, Steven D., to Magna International (Canada) Inc. Automobile. 304,914, 12-5-89, Cl. D12-91.000.
Wood, Nelson. Combined mexican jumping bean tumbler and finger ring. 304,912, 12-5-89, Cl. D11-26.000.
Yonetsu, Katsumi: *See—*
Hongo, Miyoji; and Yonetsu, Katsumi, 304,930, Cl. D14-100.000.
Yost, Holly K., to Price Pfister, Inc. Drain control knob. 304,971, 12-5-89, Cl. D23-250.000.
Zimmerman, Larry G., to Dart Industries Inc. Compartmented container or the like. 304,905, 12-5-89, Cl. D9-341.000.
Zinbarg, Benson; and Mimoun, Nancy, to Sun Hill Industries, Inc. Combined carrying bag and radio. 304,881, 12-5-89, Cl. D3-43.000.
3T S.p.A.: *See—*
Borromeo, Lucio, 304,891, Cl. D7-98.000.

LIST OF PLANT PATENTEES

Adams County Nursery, Inc.: *See*—
Harvey, Clyde H., 7,063, Cl. 34.000.

Bradford, Lowell G.: *See*—
Bradford, Norman G.; and Bradford, Lowell G., 7,064, Cl. 41.000.
Bradford, Norman G.; and Bradford, Lowell G., 7,066, Cl. 43.000.

Bradford, Norman G.; and Bradford, Lowell G. Nectarine tree (Fire Diamond). 7,064, 12-5-89, Cl. 41.000.

Bradford, Norman G.; and Bradford, Lowell G. Peach tree (Diamond Princess). 7,066, 12-5-89, Cl. 43.000.

Cornell Research Foundation, Inc.: *See*—
Sanford, John C.; and Reich, Jack E., 7,067, Cl. 46.000.

Gardner, Leith M.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 7,065, Cl. 42.000.

Harvey, Clyde H., to Adams County Nursery, Inc. Apple tree "Ginger Gold". 7,063, 12-5-89, Cl. 34.000.

Moore, Ralph S., to Sequoia Nursery. Rose plant/Morchermag. 7,061, 12-5-89, Cl. 10.000.

Reich, Jack E.: *See*—
Sanford, John C.; and Reich, Jack E., 7,067, Cl. 46.000.

Sanford, John C.; and Reich, Jack E., to Cornell Research Foundation, Inc. Red raspberry 'Watson'. 7,067, 12-5-89, Cl. 46.000.

Sequoia Nursery: *See*—
Moore, Ralph S., 7,061, Cl. 10.000.

Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G. Peach tree "Artic Gem". 7,065, 12-5-89, Cl. 42.000.

Zaiger, Gary N.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 7,065, Cl. 42.000.

Zaiger, Grant G.: *See*—
Zaiger, Chris F.; Gardner, Leith M.; Zaiger, Gary N.; and Zaiger, Grant G., 7,065, Cl. 42.000.

Zampini, James W. Flowering crab apple tree named Sutyzam. 7,062, 12-5-89, Cl. 34.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 5TH DAY OF DECEMBER, 1989

Collignon, Steven L.; and Farncomb, Robert, to United States of America, Navy. Preparation of spheroidal 3-nitro-1,2,4-triazol-5-one by crystallization. H719, 12-5-89, Cl. 548-265.000.

Farncomb, Robert: *See*—
Collignon, Steven L.; and Farncomb, Robert, H719, Cl. 548-265.000.

Greenhalgh, Wilbur O., to United States of America, Energy. Recovery of mercury from acid waste residues. H715, 12-5-89, Cl. 75-109.000.

Hester, Troy L., to United States of America, Army. Multi-sensor buffer interface. H718, 12-5-89, Cl. 377-114.000.

McDonald, James E.; and Stone, Jimmy D. Parallax induced pointing error avoidance method and means for systems using touch screen overlays. H716, 12-5-89, Cl. 340-712.000.

Stephens, William D.; and Warren, Larry C., to United States of America, Army. High burn rate ammonium perchlorate propellant. H717, 12-5-89, Cl. 149-19.200.

Stone, Jimmy D.: *See*—
McDonald, James E.; and Stone, Jimmy D., H716, Cl. 340-712.000.

United States of America
Army: *See*—
Hester, Troy L., H718, Cl. 377-114.000.
Stephens, William D.; and Warren, Larry C., H717, Cl. 149-19.200.
Energy: *See*—
Greenhalgh, Wilbur O., H715, Cl. 75-109.000.
Navy: *See*—
Collignon, Steven L.; and Farncomb, Robert, H719, Cl. 548-265.000.

Warren, Larry C.: *See*—
Stephens, William D.; and Warren, Larry C., H717, Cl. 149-19.200.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 5, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,884,295
16 4,884,297
49 R 4,884,298
4,884,299
011 4,884,296
162 4,884,300
421 4,884,301
424 4,884,302

CLASS 5

413 4,884,303
421 4,884,304
496 4,884,305
503 4,884,306

CLASS 7

156 4,884,307

CLASS 8

94.11 4,885,005
149.1 4,884,308
423 4,885,006

CLASS 12

1 R 4,884,309

CLASS 15

3 4,884,310
167.1 4,884,311
235.4 4,884,312
340.3 4,884,313
344 4,884,314
346 4,884,315

CLASS 16

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CLASS 17

11.1 R 4,884,318

CLASS 19

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106 R 4,884,320

CLASS 24

241 PS 4,884,322
442 4,884,323
712.6 4,884,321

CLASS 28

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160 4,884,325

CLASS 29

156.8 R 4,884,326
235 4,884,327
401.1 4,884,328
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430 4,884,330
558 4,884,331
568 4,884,332
596 4,884,333
623.5 4,885,007
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839 4,884,335
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846 4,884,337

CLASS 30

43.92 4,884,338
50 B1 4,709,477
90.4 4,884,339
122 4,884,340
123.3 4,884,341
162 4,884,342
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CLASS 33

1 C 4,884,345
265 4,884,347
502 4,884,348
542 4,884,346

CLASS 36

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CLASS 40

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CLASS 42

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73 4,884,354

CLASS 43

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23 4,884,356
25.2 4,884,357
42.13 4,884,358
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CLASS 51

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CLASS 53

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451 4,884,387
459 Re.33,122
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571 4,884,389

CLASS 54

7 4,884,390

CLASS 55

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241 4,885,010
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290 4,885,012
367 4,885,013
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CLASS 56

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53 4,884,391
327.1 4,884,393

CLASS 57

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CLASS 60

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274 4,884,398
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323 4,884,400
403 4,884,401
426 4,884,402
547.1 4,884,403
581 4,884,404
605.1 4,884,405
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115 4,884,412
135 4,884,413
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2 4,885,020
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CLASS 66

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CLASS 68

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CLASS 70

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CLASS 72

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82 4,884,427
142 4,884,428
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38 4,884,436
54 4,884,437
153 4,884,438
155 4,884,439
170 R 4,884,440
195 4,884,441
201 4,884,442
204.16 4,884,443
273 B1 4,250,759
290 R 4,884,444
379 4,884,445
505 4,884,446
585 4,884,447
597 4,884,448
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702 4,884,450
706 4,884,451
730 4,884,452
776 4,884,453
788 4,884,454
798 4,884,455
826 4,884,456
861.04 4,884,457
861.24 4,884,458
861.52 4,884,459
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862.06 4,884,461
863.91 4,884,462
865.8 4,884,463

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424.8 C 4,884,466
501.5 R 4,884,467
502.4 4,884,468
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710.5 4,884,470
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763 4,884,472
804 4,884,473
813 L 4,884,474
862 4,884,475

CLASS 75

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248 4,885,031
251 4,885,032

CLASS 76

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108 A 4,884,477

CLASS 81

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CLASS 82

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1.2 4,884,481
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CLASS 83

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473 4,884,485

CLASS 84

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376 R 4,884,488
736 4,884,486

CLASS 89

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14.1 4,884,490

CLASS 91

369.2 4,884,491
370 4,884,492

CLASS 92

128 4,884,493
129 4,884,494
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CLASS 98

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40.13 4,884,497

CLASS 99

352 4,884,498
449 4,884,499
517 4,884,500

CLASS 100

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CLASS 101

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CLASS 102

200 4,884,506
293 4,884,507
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CLASS 104

9 4,884,509
91 4,884,510

CLASS 105

247 4,884,511

CLASS 106

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CLASS 108

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CLASS 109

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CLASS 110

171 4,884,515
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CLASS 112

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CLASS 114

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CLASS 116

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28 R 4,884,524

CLASS 118

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CLASS 119

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72.5 4,884,528

CLASS 122

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CLASS 123

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3 4,884,531
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25 C 4,884,533
52 MV 4,884,534
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20 4,884,553
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303 R 4,884,567
303.1 4,884,568
305 4,884,569
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CLASS 132

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CLASS 134

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CLASS 135

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CLASS 141

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CLASS 144

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CLASS 148

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CLASS 152

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337.1 4,884,609
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CLASS 166

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139 4,884,642

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92 4,885,432
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CLASS 175

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CLASS 177

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CLASS 182

129 4,884,658
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CLASS 184

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CLASS 186

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322.17 4,884,665
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4 E 4,884,669
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365 4,884,676
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CLASS 204

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291 4,885,073
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432 4,885,078

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83.5 4,884,682
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320 4,884,686
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372 4,884,689
416 4,884,690
444 4,884,691
4,884,692
470 4,884,693
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631.2 4,884,695

CLASS 208

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218 4,885,080

CLASS 209

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CLASS 210

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CLASS 211

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CLASS 215

6 4,884,703
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250 4,884,705
252 4,884,706
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121.69 4,885,448
130.4 4,885,452
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4 R 4,884,710
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23.4 4,884,713
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76 4,884,715
202 4,884,716
229 4,884,717
339 4,884,718

CLASS 221

25 4,884,719

CLASS 222

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146.6 4,884,721
535 4,884,722
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623 4,884,724
639 4,884,725

CLASS 223

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CLASS 224

42.13 4,884,728
42.21 4,884,729
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311 4,884,733

CLASS 225

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CLASS 227

111 4,884,735

CLASS 228

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121 4,884,737
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CLASS 229

109 4,884,739
120.26 4,884,740
157 4,884,741

CLASS 235

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495 4,885,459

CLASS 237

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61 4,884,747
71 4,884,742
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280.5 4,884,749
337 4,884,750
468 4,884,751
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37.5 4,884,755
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222 4,884,757

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158 R 4,884,764
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145 4,884,769
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199 4,884,772

CLASS 248

56 4,884,774
237 4,884,775
481 4,884,776
548 4,884,778
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396 R 4,885,470
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CLASS 251

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23 4,884,781
129.15 4,884,782

CLASS 252

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18 Re.33,124
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100 4,885,106
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174.21 4,885,109
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352 4,885,112
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CLASS 254

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362 4,884,784
389 4,884,785

CLASS 260

397.45 4,885,117

CLASS 264

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60 4,885,120
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328.6 4,885,125

CLASS 266

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270 4,884,787
275 4,884,788

CLASS 267

140.1 4,884,789
154 4,884,790

CLASS 269

88 4,884,791
236 4,884,792

CLASS 271

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3 4,884,794
34 4,884,795
111 4,884,796
126 4,884,797
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CLASS 272

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117 4,884,801
136 4,884,802
145 4,884,803
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CLASS 273

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84 ES 4,884,809
144 B 4,884,810
157 A 4,884,811
167 H 4,884,812
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235 R 4,884,814
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53 4,884,820

CLASS 279

1 A 4,884,821

CLASS 280

605 4,884,822
731 4,884,823
770 4,884,824
806 4,884,825

CLASS 281

2 4,884,826

CLASS 283

81 4,884,827
89 4,884,828

CLASS 285

24 4,884,829
94 4,884,830

CLASS 292

38 4,884,831
173 4,884,832
316 4,884,833
350 4,884,834
357 4,884,835

CLASS 294

101 4,884,836
158 4,884,837

CLASS 296

180.1 4,884,838

CLASS 297

219 4,884,839
320 4,884,840
331 4,884,841
4,884,842
4,884,843
362 4,884,844
367 4,884,845
411 4,884,846

CLASS 299

1 4,884,847
73 4,884,848

CLASS 300

4 4,884,849
21 4,884,850

CLASS 301

37 PB 4,884,851

CLASS 305

35 EB 4,884,852

CLASS 307

66 4,885,474
261 4,885,475
272.3 4,885,476
296.8 4,885,477
425 4,885,478
443 4,885,479
448 4,885,480
463 4,885,481
465 4,885,482
492 4,885,483
495 4,885,484
542 4,885,485
570 4,885,486

CLASS 310

36 4,885,487
68 R 4,885,488
78 4,885,489
90.5 4,885,490
4,885,491
113 4,885,492
190 4,885,493
211 4,885,494
216 4,885,495
254 4,885,496
265 4,885,497
328 4,885,498
4,885,499

CLASS 312

221 4,884,853
257.1 4,884,854

CLASS 313

256 4,885,500
402 4,885,501
431 4,885,502
450 4,885,503
618 4,885,504

CLASS 315

3 4,885,505
102 4,885,506
244 4,885,507
287 4,885,508
411 4,885,509
4,885,510

CLASS 318

434 4,885,511
444 4,885,512
468 4,885,513
567 4,885,515
580 4,885,514
615 4,885,516
678 4,885,517
798 4,885,518
800 4,885,519
808 4,885,520

CLASS 320

14 4,885,521
21 4,885,522
4,885,523
25 4,885,524

CLASS 322

66 4,885,526

CLASS 323

315 4,885,525

CLASS 324

57 R 4,885,528
4,885,529
58.5 C 4,885,527
61 R 4,885,530
65 P 4,885,531
133 4,885,532
158 D 4,885,534
158 P 4,885,533
207 4,885,535
4,885,536
307 4,885,549
309 4,885,537
312 4,885,538
313 4,885,542
318 4,885,539
4,885,540
322 4,885,541
452 4,885,543

CLASS 328

110 4,885,544
151 4,885,545

CLASS 329

341 4,885,546

CLASS 330

52 4,885,551
254 4,885,547
260 4,885,548
301 4,885,550

CLASS 331

1 A 4,885,552
17 4,885,553
25 4,885,554

CLASS 333

12 4,885,555
21 A 4,885,556
124 4,885,557
139 4,885,562

CLASS 335

8 4,885,558

CLASS 336

92 4,885,559

CLASS 337

3 4,885,560
190 4,885,561

CLASS 340

310 A 4,885,563
4,885,564
407 4,885,565
425.5 4,885,572
457.1 4,885,566
463 4,885,567
518 4,885,568
519 4,885,573
571 4,885,570
573 4,885,571
711 4,885,574
712 4,885,575
793 4,885,576
825.44 4,885,577
825.52 4,885,578
825.72 4,885,579
826 4,885,569

CLASS 341

23 4,885,580
57 4,885,582
100 4,885,583
101 4,885,584
145 4,885,581
169 4,885,585

CLASS 342

13 4,885,586
51 4,885,588
175 4,885,589
196 4,885,590
450 4,885,591

CLASS 343

754 4,885,592
786 4,885,593

CLASS 346

108 4,885,594
140 R 4,885,595
157 4,885,596

CLASS 350

1.1 4,884,855
6.8 4,884,856
4,884,857
96.13 4,884,858
96.15 4,884,859
4,884,860
96.18 4,884,861
96.20 4,884,862
4,884,863
96.21 4,884,864
96.24 4,884,865
96.34 4,884,866
162.12 4,884,867
168 4,884,868

169 4,884,869
319 4,884,870
4,884,871
321 4,884,872
334 4,884,873
336 4,884,874
342 4,884,875
347 E 4,884,876
351 4,884,877
429 4,884,878
432 4,884,879
507 4,884,880
4,884,881
634 4,884,882

CLASS 351

52 4,884,883
221 4,884,884

CLASS 353

120 4,884,885

CLASS 354

106 4,885,598
173.11 4,885,599
400 4,885,600

CLASS 355

27 4,885,601
4,885,602
30 4,885,603
4,885,604
41 4,885,605
71 4,885,607
73 4,885,606
107 4,885,608
202 4,885,609
233 4,885,610
245 4,885,611
305 4,885,612
310 4,885,613

CLASS 356

31 4,884,887
360 4,884,697
367 4,884,886
373 4,884,888
375 4,884,889
384 4,884,890
446 4,884,891

CLASS 357

16 4,885,614
22 4,885,615
23.11 4,885,618
23.7 4,885,616
23.9 4,885,617
24 4,885,619
4,885,620
26 4,885,621
30 4,885,622
34 4,885,623
42 4,885,624
45 4,885,625
59 4,885,627
68 4,885,628
4,885,629
71 4,885,630

CLASS 358

21 R 4,885,631
84 4,885,632
93 4,885,633
98 4,885,634
4,885,635
133 4,885,636
4,885,637
148 4,885,638
167 4,885,639
296 4,885,641
310 4,885,642
335 4,885,643
342 4,885,644
400 4,885,640

CLASS 360

45 4,885,645
46 4,885,646
73.12 4,885,647
96.5 4,885,648
113 4,885,649
122 4,885,650
132 4,885,651
133 4,885,652
4,885,653

CLASS 361

13 4,885,654
30 4,885,655
86 4,885,656
91 4,885,657
154 4,885,658
212 4,885,659
321 4,885,661
386 4,885,662
399 4,885,126
506 4,885,660

CLASS 362

32 4,885,663
123 4,885,664
147 4,885,665
189 4,885,666
253 4,885,667
345 4,885,668
346 4,885,669
400 4,885,670

CLASS 363

17 4,885,671
21 4,885,672
4,885,673
4,885,674
26 4,885,675

CLASS 364

178 4,885,676
184 4,885,677
200 4,885,678
4,885,679
4,885,680
4,885,681
4,885,682
4,885,683
300 4,885,684
401 4,885,685
402 4,885,686
413.02 4,885,687
413.22 4,885,688
424.01 4,885,689
424.04 4,885,691
424.1 4,885,690
426.02 4,885,693
426.04 4,885,692
464.01 4,885,694
474.23 4,885,695
497 4,885,696
4,885,697
506 4,885,698
518 4,885,699
519 4,885,597
4,885,700
520 4,885,701
521 4,885,702
4,885,704
522 4,885,703
525 4,885,705
551.01 4,885,706
4,885,707
553 4,885,708
563 4,885,709
565 4,885,710
574 4,885,711
580 4,885,712
604 4,885,713
709.01 4,885,714
728.01 4,885,715
786 4,885,716
900 4,885,717
4,885,718

CLASS 365

181 4,885,719
200 4,885,720

CLASS 366

136 4,884,892
176 4,884,893
338 4,884,894
343 4,884,895

CLASS 367

25 4,885,722
35 4,885,723
77 4,885,724
129 4,885,725
142 4,885,726
146 4,885,727

CLASS 368

10 4,885,728
76 4,885,729
157 4,885,730
228 4,885,731

CLASS 369

44 4,885,732
45 4,885,733
4,885,734
59 4,885,735
275 4,885,736

CLASS 370

32.1 4,885,737
58.1 4,885,738
4,885,739
60 4,885,740
67 4,885,741
85.2 4,885,742
4,885,743
94 4,885,744
102 4,885,746
110.1 4,885,745
123 4,885,747

CLASS 371

10.2 4,885,721
21.3 4,885,748
32 4,885,749
37.4 4,885,750

CLASS 372

26 4,885,751
33 4,885,752
45 4,885,753
86 4,885,754

CLASS 374

9 4,884,896
160 4,884,897

CLASS 375

58 4,885,755
82 4,885,756
96 4,885,757
118 4,885,758

CLASS 376

203 4,885,122
233 4,885,123
260 4,885,124
462 4,885,127
463 4,885,128

CLASS 377

58 4,885,626

CLASS 378

53 4,885,759
82 4,885,760
197 4,885,761

CLASS 379

58 4,885,762
67 4,885,763
70 4,885,764
93 4,885,765
105 4,885,766
189 4,885,767
200 4,885,768
210 4,885,769
221 4,885,780
269 4,885,770
354 4,885,771
390 4,885,772
420 4,885,773
438 4,885,774

CLASS 380

10 4,885,775
15 4,885,776
23 4,885,788
25 4,885,789
30 4,885,777
48 4,885,778
56 4,885,779

CLASS 381

36 4,885,790
43 4,885,791
119 4,885,792
159 4,885,781
186 4,885,782
191 4,885,783

CLASS 382

8 4,885,784
4,885,785
47 4,885,786
54 4,885,787

CLASS 384

58 4,884,898
100 4,884,899
434 4,884,900
448 4,884,901
550 4,884,902
563 4,884,903

CLASS 388

810 4,885,793

CLASS 400

120 4,884,904
124 4,884,905
162.3 4,884,906
216.1 4,884,907
241.2 4,884,908
625 4,884,909

CLASS 401

65 4,884,910
4,884,911
78 4,884,912
196 4,884,913

CLASS 403

118 4,884,914
171 4,884,915
370 4,884,916

CLASS 405

80 4,884,917
202 4,884,918
212 4,884,919
284 4,884,920
286 4,884,921
303 4,884,922

CLASS 406

41 4,884,923
82 4,884,924
109 4,884,925

CLASS 408

115 R 4,884,926

CLASS 409

134 4,884,927

CLASS 410

103 4,884,928

CLASS 411

3 4,884,929
6 4,884,930
57 4,884,931
177 4,884,933
373 4,884,932
383 4,884,934

CLASS 414

498 4,884,935
4,884,936
505 4,884,937
541 4,884,938
698 4,884,939
715 4,884,940
744.5 4,884,941

CLASS 415

104 4,884,942
143 4,884,943
156 4,884,944
174.2 4,884,945
206 4,884,946

CLASS 416

5 4,884,947
132 R 4,884,948
170 R 4,884,949
174 4,884,950
191 4,884,951

CLASS 417

222 4,884,952
379 4,884,953
417 4,884,954

CLASS 418

1 4,884,955
15 4,884,956
16 4,884,957

CLASS 419

2 4,885,129
12 4,885,130
15 4,885,132
29 4,885,133

CLASS 420

416 4,885,134
507 4,885,135

CLASS 422

15 4,885,136
140 4,885,137
144 4,885,138
169 4,885,139
174 4,885,140
263 4,885,141

CLASS 423

22 4,885,143
54 4,885,144
219 4,885,142
230 4,885,145
235 4,885,146
261 4,885,147
309 4,885,148
339 4,885,149
366 4,885,150

CLASS 424

1.1 4,885,151
4,885,152
4,885,153
10 4,885,154
52 4,885,155
54 4,885,156
59 4,885,157
69 4,885,158
70 4,885,159
72 4,885,160
78 4,885,161
83 4,885,162
85.4 4,885,164
4,885,165
85.7 4,885,166
94.1 4,885,167
95 4,885,168
4,885,177
104 4,885,169
117 4,885,170
122 4,885,171
417 4,885,172
440 4,885,173
449 4,885,174

CLASS 425

62 4,884,958
84 4,884,959
97 4,884,960
195 4,884,961
234 4,884,962

CLASS 426

5 4,885,175
19 4,885,176
46 4,885,178
104 4,885,179
241 4,885,180
422 4,885,181
482 4,885,182
582 4,885,183
592 4,885,184
598 4,885,185

CLASS 427

38 4,885,186
58 4,885,187
126.1 4,885,188
129 4,885,189
207.1 4,885,190
212 4,885,191

CLASS 428

13 4,885,192
14 4,885,193
34.9 4,885,194
36.1 4,885,195
36.5 4,885,196
36.92 4,885,197
77 4,885,198
113 4,885,199
136 4,885,200
143 4,885,201
171 4,885,202
220 4,885,203
284 4,885,204
285 4,885,205
316.6 4,885,206
403 4,885,207
4,885,208
420 4,885,209
447 4,885,210
457 4,885,211
552 4,885,212
612 4,885,213
614 4,885,214
632 4,885,215
680 4,885,216

CLASS 429

27 4,885,217
53 4,885,218
99 4,885,219

CLASS 430

31 4,885,220
65 4,885,226
100 4,885,221
102 4,885,222
122 4,885,223
138 4,885,224
160 4,885,225
254 4,885,227
270 4,885,228
285 4,885,229
309 4,885,230
321 4,885,231
326 4,885,232
546 4,885,234
609 4,885,233

CLASS 431

1 4,884,963
277 4,884,964
4,884,965
295 4,884,966

CLASS 432

127 4,884,967
133 4,884,969

CLASS 433

90 B1 4,330,280
116 4,884,968
172 4,884,970

CLASS 434

2 4,884,971
185 4,884,972
191 4,884,973
317 4,884,974

CLASS 435

5 4,885,235
6 4,885,236
4,885,237
29 4,885,238
34 4,885,239
4,885,240
42 4,885,241
68 4,885,242
71.3 4,885,243
101 4,885,244
108 4,885,245
123 4,885,246
139 4,885,247
172.3 4,885,248
4,885,249
181 4,885,250
183 4,885,251
252.3 4,885,252
296 4,885,253

CLASS 436

85 4,885,254
512 4,885,255
518 4,885,256

CLASS 437

11 4,885,257
40 4,885,258
41 4,885,259
81 4,885,260
228 4,885,261
231 4,885,262

CLASS 439

78 4,884,975
92 4,884,976
125 4,884,977
352 4,884,978
369 4,884,979
606 4,884,980
610 4,884,981
620 4,884,982
628 Re.33,123
874 4,884,983
877 4,884,984

CLASS 440

52 4,884,985

CLASS 441

60 4,884,986

CLASS 446

77 4,884,987
115 4,884,988
168 4,884,989
220 4,884,990
369 4,884,991

CLASS 453

29 4,884,992

CLASS 455

5 4,885,794
4,885,795
11 4,885,796
40 4,885,797
52 4,885,798
78 4,885,799
98 4,885,800
264 4,885,801
344 4,885,802
603 4,885,803
606 4,885,804

CLASS 460

14 4,884,993
66 4,884,994

CLASS 464

25 4,884,995
68 4,884,996

CLASS 474

28 4,884,997
205 4,884,998

CLASS 493

439 4,884,999

CLASS 501

81 4,885,263
87 4,885,264
95 4,885,265
104 4,885,266
134 4,885,267

CLASS 502

163 4,885,268
439 4,885,269

CLASS 503

209 4,885,270
214 4,885,271
227 4,885,272

CLASS 505

1 4,885,273

CLASS 512

16 4,885,274

CLASSIFICATION OF PATENTS

CLASS 514

2	4,885,163
8	4,885,275
11	4,885,276
15	4,885,277
23	4,885,279
26	4,885,280
53	4,885,281
	4,885,282
78	4,885,283
89	4,885,284
114	4,885,285
120	4,885,286
159	4,885,287
162	4,885,288
170	4,885,289
182	4,885,290
210	4,885,291
211	4,885,292
215	4,885,278
223.2	4,885,293
227.8	4,885,294
235.2	4,885,295
252	4,885,296
253	4,885,297
	4,885,298
	4,885,299
258	4,885,300
263	4,885,301
307	4,885,302
332	4,885,303
338	4,885,304
356	4,885,305
383	Re.33,125
425	4,885,306
	4,885,307
438	4,885,308
456	4,885,309
547	4,885,310
549	4,885,311
561	4,885,312
620	4,885,313
630	4,885,314

CLASS 521

50.5	4,885,315
90	4,885,316
149	4,885,317

CLASS 522

31	4,885,319

CLASS 523

201	4,885,320
219	4,885,321

CLASS 524

82	4,885,322
95	4,885,323
204	4,885,324
236	4,885,325
281	4,885,318
291	4,885,326
376	4,885,327
430	4,885,329
447	4,885,330
539	4,885,331
714	4,885,332
762	4,885,333

CLASS 525

66	4,885,334
67	4,885,335
	4,885,336
75	4,885,337
77	4,885,338
132	4,885,339
183	4,885,340
187	4,885,341
230	4,885,342
280	4,885,343
302	4,885,344
329.4	4,885,345
424	4,885,328
426	4,885,346
447	4,885,347
458	4,885,348

CLASS 526

122	4,885,349
201	4,885,350
262	4,885,351
348.1	4,885,352

CLASS 528

68	4,885,353
94	4,885,354
99	4,885,355
340	4,885,356

CLASS 530

373	4,885,357
387	4,885,358
396	4,885,359

CLASS 534

642	4,885,360

CLASS 536

118	4,885,361

CLASS 540

364	4,885,362
465	4,885,363
523	4,885,364

CLASS 544

161	4,885,365
300	4,885,366
347	4,885,368

CLASS 546

216	4,885,367

CLASS 548

183	4,885,369
486	4,885,370
554	4,885,371

CLASS 549

215	4,885,372
458	4,885,373
532	4,885,374
557	4,885,375

CLASS 556

18	4,885,376
136	4,885,377
426	4,885,378

CLASS 558

34	4,885,379
83	4,885,380
155	4,885,381

CLASS 560

75	4,885,382
103	4,885,383

CLASS 562

406	4,885,384
413	4,885,116
430	4,885,385
493	4,885,386
515	4,885,387

CLASS 564

417	4,885,388
418	4,885,389
475	4,885,390
491	4,885,391
503	4,885,392

CLASS 568

8	4,885,393
14	4,885,394
314	4,885,395
315	4,885,396
332	4,885,404
341	4,885,397
404	4,885,398
410	4,885,399
454	4,885,400
	4,885,401
469.9	4,885,412
620	4,885,402
631	4,885,403
698	4,885,405
716	4,885,406
724	4,885,407
779	4,885,408
834	4,885,409
861	4,885,410
864	4,885,411

CLASS 570

104	4,885,413
130	4,885,414
144	4,885,415
170	4,885,416
211	4,885,417
	4,885,418

CLASS 585

25	4,885,419
322	4,885,420
403	4,885,421
419	4,885,422
427	4,885,423
450	4,885,424
458	4,885,425
474	4,885,426
480	4,885,427

CLASS 600

21	4,885,000

CLASS 604

4	4,885,001
9	4,885,002
22	4,885,003
	4,885,004

CLASS 919

12	4,885,131

CLASSIFICATION OF DESIGNS

D2—	226	304,875
	314	304,876
		304,877
D3—	30.1	304,878
	32	304,879
	35	304,880
	43	304,881
	54	304,882
D4—	137	304,883
D6—	311	304,884
	379	304,885
		304,886
	509	304,887
	574	304,888
D7—	9	304,889
	70	304,890
	98	304,891
	99	304,892
		304,893
	101	304,894
	148	304,895
	369	304,896
	374	304,897
D8—	23	304,899
	26	304,898
	39	304,900
	49	304,901
	50	304,902
		304,903
	380	304,904
D9—	341	304,905
	383	304,906
	418	304,907
	423	304,908
		304,909
		304,910
D10—	60	304,911
D11—	26	304,912
	145	304,913
D12—	91	304,914
	96	304,915
	129	304,916
	146	304,917
		304,918
	147	304,919
	188	304,920
	190	304,921
	303	304,922
	308	304,923
	331	304,924
		304,925
D13—	8	304,926
		304,927
	10	304,928
	12	304,929
D14—	100	304,930
		304,931
	101	304,932
	105	304,933
	107	304,934
		304,935
		304,936
	109	304,937
	121	304,938
	138	304,939
	151	304,940
	156	304,941
		304,942
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	231	304,945
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D15—	4	304,947
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	139	304,949
D16—	102	304,950
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D17—	20	304,953
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D18—	12	304,955
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D19—	62	304,957
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D20—	20	304,960
D21—	108	304,961
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	253	304,966
D22—	110	304,967
	113	304,968
	129	304,969
D23—	231	304,970
	250	304,971
D24—	29	304,972
		304,973
	41	304,974

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DESIGN PATENTS

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PLANT PATENTS

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